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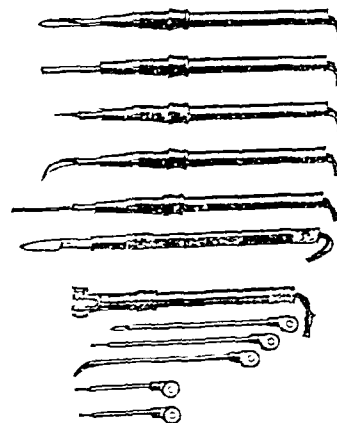
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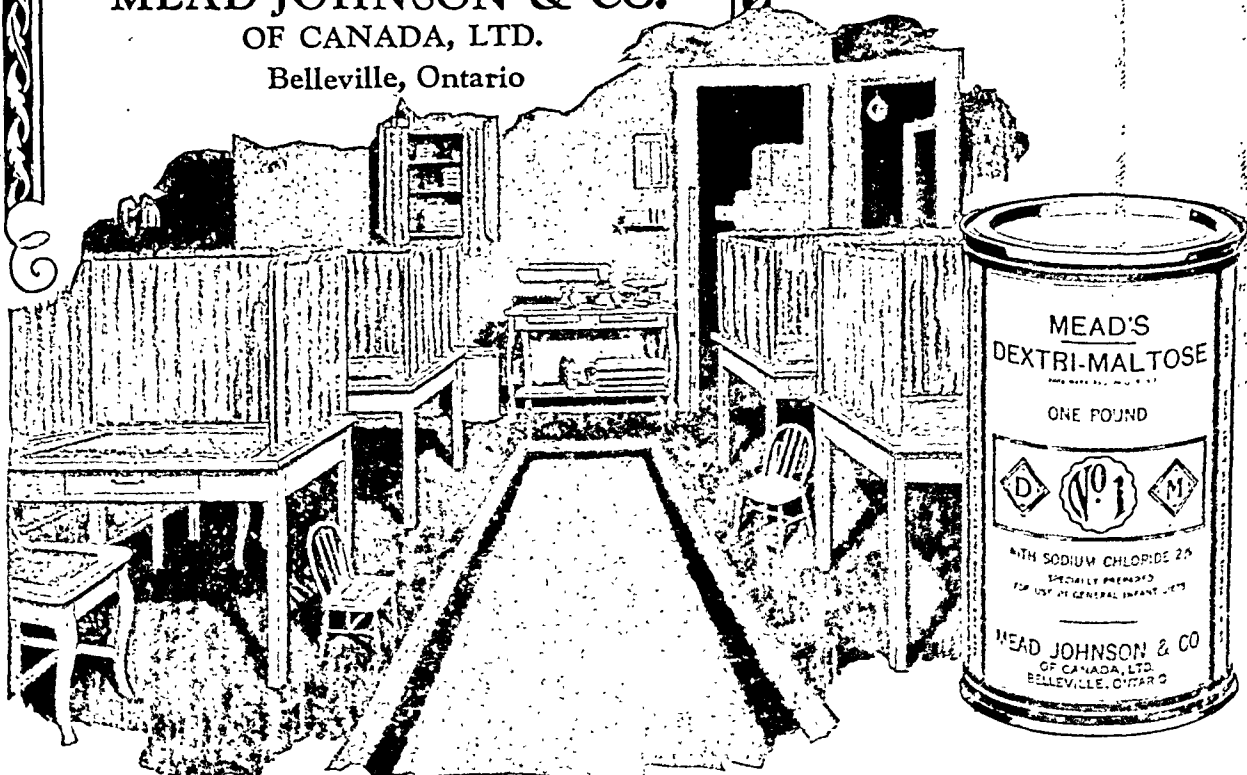
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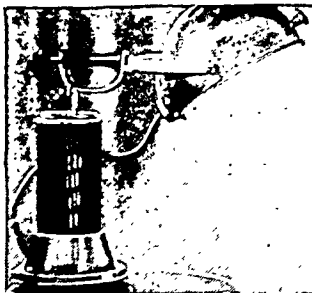


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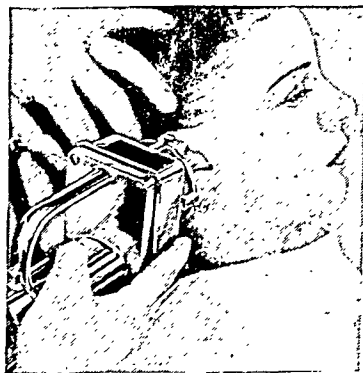
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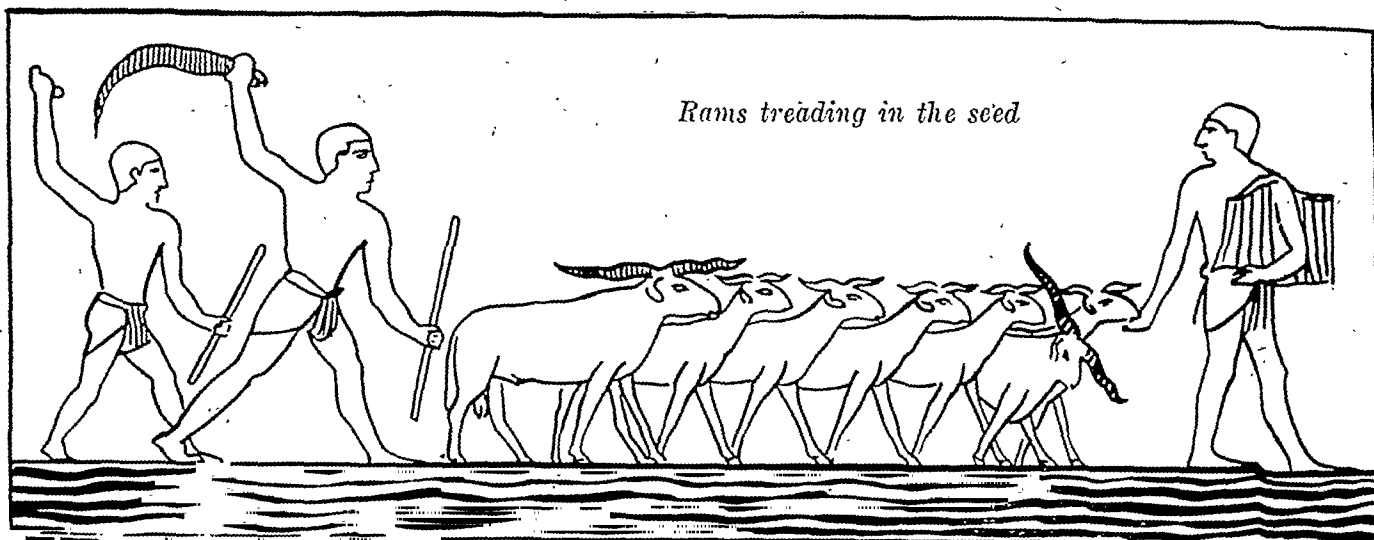
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No. 1

An Address

ON

THE OCCASION OF THE DEDICATION OF THE OSLER LIBRARY

By W. S. THAYER, M.D., LL.D.,

Baltimore, Md., U.S.A.

EARTH, also, has its immortalities; the immortality of inheritance; the immortality of repute; and that other, surer, immortality which lies in the transmission through generations of the beneficent influence of a noble life. The memory of the man may perish; his influence can never die. The message that was his is carried on through the years, hidden though it may be from the consciousness of mankind; mute but quickening.

Yet the familiar and profound truth that in this life it is deeds and not words that count seems, sometimes, a paradox. For 'tis so easy, to-day, by voice or image or written character to impress one's name on the public conscience, that to the myopic masses, the word seems all powerful. To the initiated, however, the true significance of a man's words, as they are uttered, is clear only when one may look in his eyes. Even in life the word, "unless the deed go with it," is ephemeral. Empty words are soon forgotten. After death 'tis strange how quickly the word and the speaker pass out of memory. Sterile seeds perish in the womb of time.

The unwritten message of man endures only when it is a message and not a mere sound. Books are men's messengers. They alone preserve, through a precarious existence, the name of the many; and it is not unhappy that the life of the arid pulp of the average product of the modern literary flux is as brief as is the message it bears exiguous. But words instinct and vital with the spirit of one who dreamed lofty dreams, whose life measured up to his

ideals and his dreams—such words live, and through them breathes the essence of him from whom they sprung. They not only live; they grow. Happy the book pregnant with such words! The full message of a man's life, while yet he lives, is often as a seed sown in the earth, hidden from the eyes of the world, apparent only in the blossom of its resurrection.

Osler has been dead nearly ten years. He is just as much alive to us who were his students and his fellows as he ever was. His figure looms larger. His message is clearer, far more familiar and far better understood by the world than it was in his lifetime, for it is the message of a truly great character. I venture to say that this has surprised some of his friends and students. They loved him; they admired his skill; they respected his learning; they looked up to his simplicity, his industry, his charity, his tolerance, his temperance, his equanimity, his devotion to his vocation and to his literary avocations, to his knowledge of books and history, to his reverence for the past and his confidence in the future; they depended on his advice, rarely proffered, always ready when sought; they relied on his sincerity and candour and loyalty, for as he had never spoken ill of others, so could he never speak ill of them; they delighted in his alert eye, his sparkling wit, his nimble tongue; they marvelled at and envied his power of self-protection and his control of his own time. They thought of him as an ever-present, unfailing friend with whom everyone was at home, no one ill at ease; he was a part of their lives. "The Chief," Sir William Osler. When he died they

felt a great emptiness; they found that 'twas difficult to conceive of life without him. They discovered that he who seemed so simple, so like anyone else, so natural—was unlike anyone else; there was no one else like him. There were others as skilful, others as clever, others as learned, others as witty, others as kindly, others as honest, others, but very few, as simple, others as candid, others as wise; there was no one attribute which, on analysis, seemed wholly unique—but he was different. Certainly his was an unusual combination of qualities and powers, a combination of remarkable perfection and rare charm.

Not all his associates, I am sure, realized all this until he had gone. Man, with his imperfect vision, rarely recognizes pure wisdom when it is at his side. And yet Pallas Athene still lives, hidden in the homely bodies of men, to reveal herself only in the flower of their memories.

“So springs and strives through the soil that the
legions of darkness have trod,
From the root which is man, from the soul in
the body, the flower which is God.”

Thirty years ago Osler said to the students of McGill:

While medicine is to be your vocation, or calling, see to it that you have also an avocation—some intellectual pastime which may serve to keep you in touch with the world of art, of science, or of letters. Begin at once the cultivation of some interest other than the purely professional. . . . No matter what it is—but have an outside hobby. For the hard-working medical student it is perhaps easiest to keep up an interest in literature.

Literature was his avocation. Profoundly human, tenderly humane, he had an innate understanding of his fellows, a keen interest in their hidden virtues, an infinite charity for their failings. Through the book he looked ever for the man. The little notes on fly leaf or cover in fine, careful, handwriting are full of reference, almost loving, to the life and habits and history of the author. This human interest might indeed be called the keynote of his life. See how it stands out on every page of the story of his career so vividly set before us by the reverent and masterly hand of Cushing! For eight years, during his Baltimore days, class after class of students at the Saturday evening conferences about his dining table watched the growth of his library. And as the new treasures, “presents from Mrs. Osler” as he used to call them, were shown to them and to us, his assistants, it was

generally with stimulating references to the life and character of the author.

Osler's love of his fellow man was shown daily in his never-failing consideration for patient, student, and assistant, and in his reverence for his older colleagues and teachers and for the great figures of the past; a reverence charmingly manifested in his biographical essays such as those collected in *An Alabama Student*.

To his vocation he gave his life. His devotion to his calling never lessened, but, in his Oxford years, he rejoiced in the richly earned privilege of a larger liberty to give himself to his literary avocations, and to enjoy the companionship of scholars. There, books which are not wholly devoid of will, sought him, gathered about him, and took new life from him, life which they still suck from his ashes. And when he ceased to walk with men, they found in her in whose heart his spirit endured, a nurse, a guardian, and a comforter.

A striking attribute of human greatness is the sureness with which the master, in the execution of a lofty design, attracts his appropriate complement. The generous project of his great and growing catalogue begun, the guiding spirit gone, the necessary complement was inevitably at hand. In nearly nine years of meticulous labour, his cousin Francis, the devoted and worthy upholder of a noble tradition, has made this work not only the faithful catalogue of a great collection and a loving memorial of its illustrious founder; he has erected a bibliographical monument of unusual perfection and completeness, such as would have warmed the heart of him who was its *fons et origo*. A pious task piously accomplished!

That these books and his ashes should come back to Montreal is entirely fitting. Osler could not have willed it otherwise. It was the natural gesture of loyalty and love. His instinctive, un-failing, loyalty was one of the most beautiful of his qualities. Osler loved his fellow man. He was a man and nothing human was foreign to him. He hated narrow Chauvinism in life and in medicine. In all his teachings he referred his students to the man who had led the way. The symptom or the disease became to them associated with the man, not through the vain repetition of a name but through the story of the life of a great student or an intrepid searcher for truth, or a keen observer, and his character and

his qualities and his contributions, and the incidents which led to this particular contribution. In like manner, in current medicine he taught his pupils and associates never to allow the work of a foreign colleague to escape their notice. In the Johns Hopkins Hospital he started, early, a "Journal Club," for the special purpose of keeping abreast of foreign publications. He never failed to give credit to the work of others. He taught us to seek and meet and correspond with students of other lands. He urged us to travel and often put the means in our way, contributing generously from his own resources. He was completely free from local or national jealousy or prejudice. Wherever there lived, or had lived, men of great heart and fertile mind there Osler was at home.

He loved to call himself a peripatetic. Twenty of his most active years he spent with us in the United States, where we felt that he was our own. There, as everywhere, he treasured and remembered his associates and his associations, and beyond the sacred memories in the hearts of men, we have, in the medical clinic at the Johns Hopkins University a precious monument of his genius, and in the Tudor and Stuart Club a fragrant memorial of a fleeting figure of beauty and promise. But, deep in his heart there was a love for and a loyalty to the land of his birth and the institution which had nourished his early efforts; that institution to which he had devoted his first years as a teacher; and beyond it all there was that deep, reverent, ineradicable love for the Old Home which is a vital part of more of us of common British ancestry than realize it or confess it. I fancied always that he would end his days in England. The Old Country was, after all, the home of his spirit. That the love of the land of his birth and the nursery of his expanding mind should call back his ashes and the most precious of his earthly accumulations was a beautiful and natural manifestation of that perfect loyalty in which he could not have failed.

In the wide world of to-day in which we wander afar, we have many homes; the home of our birth; the homes of our activities; the home of our spirit. And we have many loyalties. But strong as the ties may be which bind us to the homes of our activities, deep as our loyalty may be to the beloved home of our spirit, it is

to the home of our birth that the true loyalty generally leads us in the end.

It is not only his ashes that have come home. As I speak I hear the voice of the books. For books can speak. Listen to their voice:

"Men, men, grandchildren of them whose word we bear, you who have built this shrine:—Hearken to the word of the book: Shaped by the hands of mortal men who vanished from the light of day in the hour of our infancy, we are the bearers of their spirit through the centuries. On us depends their human immortality, that immortality which is recognized by men. But another message we bear, a message beyond that which is written, a message borne in our own substance, in our characters, in our garb, a message which tells of times and men and customs and history, an unwritten message expressed in language which is our own, our message.

"Though our history be short, our life is long compared to the life of men. But though we be the guardians of his mundane immortality, the life of the book which depends upon the children of men is uncertain, full of vicissitudes, and beset with danger and care. For man, whose message we bear, is short-lived and fickle, restless and forgetful, intolerant and cruel.

"Born of man, we have perished too often in flames kindled by the hands of the brothers and children of them whose creatures and servants we were, who have sought in fanatical hatred, to destroy in us the seeds of that human immortality which we guard. Until but yesterday we spread man's message in words which every scholar understood, in the language of scholars. But, almost in a day, the children of men, absorbed in wordly things, have forgotten the speech which was once a common bond, and heedless and un-understanding, have consigned us too often to the cruellest of fates, oblivion, where on dusty and forgotten shelves, pierced and consumed by the silent and relentless *Anobium kirtum*, we have wasted in slow and fatal marasmus.

"Tis true that some among us have found refuge and tender care and regal garb, but all too commonly we have been carried far from home to pass our lives in exile among those who, blind to the written message and deaf to the voice within us, respect no propitiation."

princes in their jewelled robes, in all our ease and splendour, we are lonely.

"But in all times there have been those rare spirits who see and read and feel our message, who hear our voice, who love us for what we bear and for what we are; who find in us food for new and higher dreams and aspirations; whose loving and understanding hand adds fresh and fecund thoughts to our pages; thoughts that emblazon and consecrate the past and illumine the future.

"For there are some men whose touch is as the touch of an enchanter, a touch which reveals and transmits the love of men and the understanding of men, the love of books and the understanding of books, reverence for men and reverence for books; in whose very ashes lives a spirit which to us is life and peace and home.

"Such an one was he whose ashes we guard. It is such as he that assure us that our labour

has not been in vain. In such men is our renaissance.

"We hold his ashes in our embrace. His ashes are our heart. Men say that ashes are dead. The ashes of a great spirit never die! They are as the grateful soil that receives the seed in the fall. They are as the snow that protects it and keeps it warm in winter. They are as the showers in the spring, and the sun in summer. In them lies the promise to the spirit of man of an ever-recurring harvest.

"His ashes are our heart. So long as they are our heart, so long shall our message live and work in the hearts of men. So long shall we live. Think not that these ashes are dead. The ashes of a great spirit are immortal!"

So speak these books. And so to-day we dedicate this shrine where they shall live, nourished by his ashes, and deliver to us and to our children their message and his.

An Address

ON

INTRINSIC CANCER OF THE LARYNX; THE LASTING CURE IN 76 PER CENT OF CASES BY LARYNGO-FISSURE*

BY SIR STCLAIR THOMSON, M.D., F.R.C.P. (LOND.), F.R.C.S. (ENG.),

London, Eng.

CANCER is at first a local and limited disease.

It should therefore be curable by local and fairly limited operations. To secure this there are two important requisites; the first is that a correct diagnosis be made while the disease is in an early stage, and the second is that it occurs in a region where it can be excised without great risk to life and without severe mutilation.

These two provisos are fully met with in one group of laryngeal cancer, while they are sadly wanting in another. For, as you well know, it is fifty years since Krishaber of Paris drew attention to the great clinical difference between extrinsic and intrinsic cancer of the larynx. The difference between these two groups is very striking. In the extrinsic group the symptoms

are insidious and not well marked; diffusion is rapid; the lymphatics are early invaded; and operative treatment can only hold out hope of lasting cure in a few cases. Indeed, Mackenty goes so far as to say that "all extrinsic cancer of the larynx cannot and never will be curable by surgery." Extrinsic cancer affects the outer surface of the larynx, or the borders of the aditus ad laryngem, *i.e.*, the epiglottis, the ary-epiglottic folds, the arytenoids, the retro-cricoid region, and the posterior surface of the larynx (*i.e.*, the sinus pyriformis). I need not refer further to this group of laryngeal cancer. It does not concern us to-day.

Let us turn to the intrinsic manifestation which chiefly attacks the vocal cords, and, particularly, the anterior part of them. Here the one definite symptom—for many months the solitary indication—is hoarseness. It is

* Address delivered in Montreal before the Canadian Medical Association, June 19, 1929.

slight at first, and so may be insidious, but it is persistent and increasing. It causes no cough, no dysphagia, not even discomfort; appetite, health, vigour, weight and bien être are all unaffected, and there are none of the symptoms which a previous generation waited for before diagnosing cancer of the larynx, viz., pain, cough, blood-stained sputum, foetid breath, enlarged glands, wasting and cachexia. By the time these conditions have developed the case is hopeless.

How is an early diagnosis to be made? By first realizing that any huskiness or hoarseness persisting for longer than the customary three weeks of an ordinary catarrhal laryngitis requires the skilled inspection of the larynx by an expert. In early life such an examination may reveal the first indication of tuberculosis. In later years it can detect an epithelioma which can be safely removed with lasting cure and the preservation of a useful voice.

Fortunately, the intrinsic form of cancer in the larynx is much more common than the extrinsic, at least in males. It is not known in females, although with them the extrinsic form is much more common. Cancer, as we know, is more frequently met with in males in the tongue and pharynx. As we descend the œsophagus the frequency of cancer goes diminuendo with the females, while with the males it goes crescendo. [Sir StClair Thomson here demonstrated various stages in laryngeal cancer by means of lantern slides.—ED.]

The brilliant results of operation by the laryngo-fissure route are chiefly due to the pioneer work of two British laryngologists at the end of the last century—Butlin and Semon.

I have now the honour of submitting to you the results I have obtained in 70 consecutive cases. Every case in this series has been made public.

Laryngo-fissure is not simply, as has been suggested, "splitting open the larynx and clipping out a cord." Such an inadequate and unsurgical procedure for a disease like cancer could hardly hope for satisfactory results. As you will see from this diagram the technique is that of a partial laryngectomy, almost a complete hemilaryngectomy, but performed from the inside. After the larynx is split open lengthwise, one thyroid ala is removed and all the soft tissue internal to it, from its internal perichondrium

to the mucous membrane of the glottis, from the ventricular band above, to the subglottic space, and from the anterior commissure back to and embracing the vocal process of the arytenoid cartilage. This is all removed in one mass.

CLINICAL MATERIAL

I have operated, through a laryngo-fissure, on 70 cases of intrinsic cancer of the larynx.

TABLE I.—CASES OPERATED UPON BY LARYNGO-FISSURE (1900-1928).

	No. of Cases	Private Cases	Hospital Cases	Age Limits
Male.....	63	56	7	40-80
Female.....	7	4	3	35-58
Total.....	70	60	10	

Proportion of Male and Female Cases

Looking at Table I we notice the large preponderance of males and of cases in private practice. Hospital patients are only less numerous for the simple reason that the ignorant and uneducated do not present themselves early for what they regard as a trifling huskiness, or, if they do, will not accept advice until the lesion has so far advanced that complete laryngectomy is the only possibility.

Age Distribution

In the next table (II) we note the incidence of my 70 cases according to sex and decade.

TABLE II.—INCIDENCE, ACCORDING TO AGE AND SEX, OF 70 CASES OF INTRINSIC CANCER OF THE LARYNX

Ages:	21-30	31-40	41-50	51-60	61-00	Over 70	Over 80
Male	0	2	14	28	13	5	1
Female.....	0	3	2	2	0	0	0
Total (both sexes)	0	5	16	30	13	5	1

Here it is noticed that cancer of the larynx is not unknown between 30 and 40 years of age (of course, cases at much earlier ages have been recorded); that, in men, it may occur in advanced life; and that it appears to be most frequent with them in the sixth decade of life. With regard to the females in my list (7) the numbers are, perhaps, too small to justify many conclusions; but it is at least noteworthy that, with them, cancer would appear to be met with earlier in life and to be rarer after 60. All these women were non-smokers and abstainers.

RESULTS

Alive and Free from Disease

My results are displayed in the following tables. The first shows that, of 34 patients alive to-day, 32 have survived for periods varying from the date of operation.

TABLE III.—THIRTY-FOUR CASES OF INTRINSIC CANCER OF THE LARYNX ALIVE AND WELL, WITHOUT RECURRENCE, AFTER LARYNGO-FISSURE

Case No.	Age at Operation	Sex	Present Age	Period since Laryngo-fissure	Case No.	Age at Operation	Sex	Present Age	Period since Laryngo-fissure
6	59	M	78	19 years	45	35	F	43	8½ years
11	48¾	M	64¾	16 "	47	60	M	68	8 "
18	65	M	79	14½ "	50	53	M	60	7 "
21	66½	M	81	13½ "	52	40	M	47	7 "
22	59	M	73	13¼ years; 12 since gland operation	53	58	M	65	7 "
26	46	F	58½	12½ years since first cord; 5½ since second cord	54	58	M	65	7 "
27	57½	M	70	12½ years	55	47	M	56	7 "
29	47½	M	60	12½ "	56	80	M	86½	6½ "
31	50	M	62	12 "	58	79	M	85	6 "
32	53	M	65	12 "	60	52	M	58	6 "
33	67	M	79	12 "	61	49¾	F	56	5-2-3 "
36	60	M	70	10 "	62	58	M	62	4¼ "
38	40	F	51	10 "	63	56	M	60½	4¼ "
41	33	F	42½	9½ years since laryngo-fissure; 8¼ years since partial laryngectomy	64	74	M	78	4¼ "
42	48	M	56½	8-1-3 years	65	54	M	58	4 "
44	58	M	67	9¼ years	66	62	M	66	4 "
					69	56	M	56	1½ "
					70	62	M	62	1½ "

Healthy, Useful, and Prolonged After-History

Attention might be directed to the advanced age of many of the survivors, to their health and vigour, and to the social well-being secured by having conserved a useful voice. No. 11 is a Canadian, sent to me sixteen years ago by Dr. Birkett. No. 18 is an active shipbuilder in Scotland. No. 21, in his eightieth year, writes that he still cycles. No. 31 is an admiral; he is devoted to social work and can address meetings in the open air. Four are physicians in active practice (Nos. 52, 59, 63, and 66).* Two are lawyers who conduct large affairs (Nos. 47 and 55). A clergyman is able to preach twice on Sunday (No. 44). A schoolmaster retains his post (No. 50). A gentleman, aged 67 when

* Shown before the Royal Society of Medicine, November 4, 1927. See *Proc. Roy. Soc. Med.*, December 1927, *Laryng. Sec.*, p. 1.

operated on, is now 79 (No. 33). Four years ago he passed safely through the operation for enlarged prostate. This year he celebrated his golden wedding and made a speech which was audible at a dinner he gave to 120 of his employees. No. 56 is a retired judge who follows the hounds on horseback, six years after his operation and in his eighty-sixth year.

Deaths from Other Causes

Of the 73 patients 18 have died from other causes, without recurrence (Table IV). Of these, it will be noticed that 13 had lived a minimum period of three years without any recurrence, while 3 of them died ten or more years after operation. (The two "operative deaths" will be considered later).

TABLE IV.—EIGHTEEN DEATHS FROM OTHER CAUSES, WITHOUT RECURRENCE

Case No.	Age at Operation	Age at Death	Period after Operation	Cause of Death when Ascertainable
2	49	50½	1½ years	Laryngitis
3	48	58	10 "	Tubercle
5	54	61	7 "	Unknown (hospital patient, inspected 2 years before death and found sound).
8	58	61½	3½ "	Aneurysm
9	68	74	6 "	Bronchitis
10	55	60-7	5-7 8 "	Pneumonia (an Indian subject)
12	53 (F.)	67½	14½ "	Influenza
17	69	75	5¾ "	Cerebral hæmorrhage
23	68	76½	8½ "	Urinary toxæmia
25	72	84	12 "	Heart failure
28	48	49	11 months	Developed pleuro-pneumonia with fetid empyema 1 month later. Operation: good recovery.*
30	63	65	1-2-3 years	Angina pectoris
34	75	85½	10½ years	Heart failure
35	58½ (F.)	62	3-2-3 "	Cerebral hæmorrhage
36A	70	74	4 "	Unknown
37	69¼	78	9 "	Heart failure; arterio-sclerosis
40	56	56	50 hours	Operative (hæmorrhage, morphine, pneumonia)
51	42	42	4 days	Operative (rupture of œsophagus)

* No details obtainable, but Logan Turner found no signs of recurrence two months before death.

DEATHS FROM MALIGNANT DISEASE ELSEWHERE, WITHOUT RECURRENCE

If time permitted it would be interesting to study in detail the seven cases in the next table—that of death from carcinoma elsewhere, without local return of the disease (Table V). In two of them (Nos. 15 and 57) the virulence of the cancer must have been very intense, for glands in the neck were invaded within four and six months, and the patients were dead

within seven and eleven months, although the larynx in each case was free from recurrence.

a failure, or why the case was unsuitable for this type of operation.

TABLE V.—SEVEN DEATHS FROM LATER DEVELOPMENT OF MALIGNANT DISEASE ELSEWHERE, THE LARYNX REMAINING FREE

Case No.	Age at Operation	Time of Onset after Operation	Age at Death	Time Elapsed since Operation till Death
1	47	Malignant disease at base of tongue opposite side, started 1½ years after.	50	3 years.
7	43	Larynx filled up 3 to 7 months after operation. Laryngectomy after 9 months, but no cancer growth found in excised larynx (syphilis). Diffuse malignant disease in glands of neck 7 years later.	51	7½ years.
13	58	Death from malignant disease in abdomen, found at operation too extensive for removal.	69	11 years.
15	52	Infiltration of glands of neck within 4 months.	52½	7 months.
39	64	Glands in neck.	68½	4½ years.
43	54	Mediastinal glands (x-ray findings).	57	3 years.
57	39	Glands in neck within 6 months.	39½	11 months.

In contrast to these cases are Nos. 39 and 7, in which the glands did not develop until four and seven years after operation.

Deaths from Local Recurrences

We now come to the local recurrences. There were only 11, all males. It will be noticed in Table VI that in 8 of these the recurrence took place within the first year. This supports Semon's dictum that a recurrence generally takes place within the first twelve months. Personally, I feel little anxiety if the third month passes without any suspicious symptoms.

TABLE VI.—ELEVEN DEATHS FROM LOCAL RECURRENCE

Case No.	Onset after Fissure	Period till Death after Fissure
4	8 months.	20 months and 12 months after total laryngectomy.
11A	74 to 6 months.	79 months.
14	3 years.	3 years (second laryngo-fissure; death from idiosyncrasy to heroin).
16	2 months.	5 months.
19	3 years.	4½ years.
20	3 months.	1 year.
24	1 month suspicion, and certain in 4 months; tracheotomy at end of 5 months.	15 months.
46	2 months (declined laryngectomy).	11 months.
48	3¼ years.	4¾ years.
49	2 months.	7 months.
67	2 months.	4 months.

These early relapses should not be regarded as a "recurrence of disease." We are more likely to advance the subject if we frankly regard them rather as "incomplete removals," and then investigate why the operation was

Operative Deaths

Of the 74 laryngo-fissures performed on 70 patients (2 of the 70 having been operated on for a local recurrence and 2 requiring a supplementary laryngo-fissure) 2 have died within forty-eight hours of the operation, one from idiosyncrasy to heroin, and the other from having been given a larger dose of morphine than had been intended, although, even then, ¾ grain would not under the circumstances be regarded as a large dose. I think death would have been avoided in both cases if no soporific had been given. I now refuse to give an opiate of any kind before or after operation, and I forbid all "dopes" before anæsthesia (mixed, local and general). A third case, No. 51, died on the fourth day from rupture of the œsophagus due to post-anæsthetic vomiting, a very rare accident, not connected directly with the operation. Accepting these 3 cases as operative deaths, this would give a death rate of 4 per cent—a very different figure from that recorded by the pioneers of this subject, and from that still existing in the few statistics which are rarely published.*

If permitted to delete No. 51 (rupture of the œsophagus) I have had no operative death since case No. 40. This sequence of thirty cases without a disaster encourages me to give it as my opinion that if a laryngo-fissure is carried out with the precautions and care I insist on in regard to hæmorrhage and the descent of blood into the bronchi, then it should be an operation free from any danger, except that incidental to all operations.

Lasting Cure

We need not revive barren discussions as to how long after operation a patient may be regarded as permanently cured of cancer.

With few exceptions, all patients are in middle or advanced life. To ensure a comfortable and a vocal existence for ten to twenty years to 12 men who have passed their forty-seventh to sixty-seventh year (as in the first 12 cases of Table III): to operate on men of 79 and 80 years of age (Nos. 58 and 56), and to

*The results of indiscriminate operation have been so bad that their records are unobtainable because suppressed."—D. Bryson Delavan.

show them healthy and vigorous five years afterwards; and to restore doctors, lawyers, clergymen, and schoolmasters to their calling, are surely sufficient evidence to claim this method as securing permanent cures.

Dr. Bryson Delavan, twenty-four years ago, said that "statistics based on alleged cures of less than three years' duration are worthless."

A scrutiny of the tables I have submitted will show that 63 patients are eligible on this basis, and that 48 of them were alive and well and free from recurrence at the end of three years. This lasting cure of 76 per cent has been obtained without restricting oneself to particularly promising cases. As the indications for laryngo-fissure have not yet been quite established—beyond that of being a suitable operation for many cases of intrinsic cancer—I thought it right to try it in various intralaryngeal manifestations of the disease. Although this may have impaired the statistical results, it has enabled me to form some clear conclusions as to the indications and limitations of the laryngo-fissure route for the eradication of intrinsic cancer of the larynx.

CONCLUSIONS

If intrinsic cancer of the larynx is diagnosed early it is best operated on by laryngo-fissure—an operation which should be free from danger to life and followed by an adequate voice and a lasting cure. The only necessities for this consummation are early diagnosis and meticulous care in operative precaution and procedure.* By educating the public to pay prompt regard to persistent hoarseness, and by teaching the profession to appreciate the

niceties and necessities of early diagnosis, the number of laryngo-fissures and the proportion of lasting cures will steadily increase, while the need for laryngectomy will as progressively diminish.

In other regions of the body there may be better remedies than surgery can supply. In intrinsic cancer of the larynx other, simpler and surer, remedies no doubt will one day be discovered; but, at present, there is no better way than surgery and the laryngo-fissure route. By this we can secure results which have not been surpassed in the treatment of cancer in any other internal region of the body. I have tried to demonstrate this by referring to the active lives led by many of these patients, including voice-users, such as schoolmasters, clergymen, lawyers and doctors. I have also quoted statistics. There is a well-known saying that there are three kinds of lies,—lies, damned lies and statistics! But, again, there is another saying that statistics can prove anything,—even the truth! So I conclude with showing two photographs to strengthen my thesis. The first shows Case 31, an Admiral whom I met in France during the war and operated on in 1917. You see him making a political speech twelve years afterwards in a market square in Devonshire. I will not disturb the harmony of this gathering (or "throw the apple of discord into this meeting") by telling you whether he is a Conservative or a Liberal!

The last picture shows Case 56, the judge who hunts the fox, six years after his operation and in his eighty-sixth year. In sending me the photograph he wrote to explain that he did not know he was being snapped, as otherwise he would have looked at the camera. But he pointed out that his old mare evidently recognized the photographer and, being a lady, made an effort to smile, although only a horse smile!

* "Mistakes hardly short of criminal have occurred in laryngeal operations done by inexperienced men working with absolutely no trained helpers."—D. Bryson Delavan.

DOMESTIC LIVER EXTRACT FOR USE IN PERNICIOUS ANÆMIA.—The sufferer from pernicious anæmia, like the diabetic patient, must frankly face the necessity of continued attention to his treatments, probably for the rest of his life. William B. Castle and Morris A. Bowie, describe a process by which it is possible for any reasonably intelligent person to make from inexpensive beef liver an extract effective in the treatment of pernicious anæmia. The expense of the process, aside from the initial cost of the utensils needed, which are found in most kitchens, is practically the cost of the liver alone.

With a little experience the time involved should not be greater than one-half hour daily. The extract so produced should not exceed in amount two ordinary drinking glasses (500 c.c.) of a liquid tasting very like beef broth, and almost entirely free from the peculiar flavour of liver which offends many patients. The process is based on the first few steps of the original procedure used by Cohn and his associates in the preparation of their extracts of liver effective in the treatment of pernicious anæmia. It can be carried out by the patient.—*J. Am. M. Ass.* 92: 1830, June 1, 1929.

with its incidental economic advantages, and the greater certainty of permanency when effective bone-grafting has been carried out in properly selected cases, is hardly open to serious question. It is true that there is still considerable difference of opinion as to the relative merits of mechanical and operative methods in the management of spinal tuberculosis, many of the older group of orthopaedic surgeons being inclined to conservatism. Even among the conservatively inclined, however, it is more and more generally admitted that operative treatment should be resorted to in adults, however doubtful it may be in the case of children. My own judgment, based upon observation and upon a fairly large experience, is that operation, either by the Albee or the Hibbs method, or by various modifications and combinations of the two, is applicable with advantage to the great majority of all cases of this disease even in children as young as four or five years. In the younger patients it may be wiser to afford some form of mechanical protection for a year or more afterwards; but the operation alone, if performed with sufficient thoroughness and followed by three months of recumbency in properly constructed plaster shells, will bring about arrest of the local disease in most cases in children as well as in adults. I have long been convinced that unsatisfactory results of operative treatment can usually be traced to want of thoroughness in performing the operation, to failure to include in the operation a sufficient number of vertebrae, or to neglect of details in the after-treatment.

The question has often been raised as to the effect of a bone-grafting or fusion operation on the future development of the immature spine of a child. Some slides which I will show you have some interest in that connection. They are of a young man, now twenty-two years of age, upon whom I did an Albee operation in February, 1914. He was then seven years of age and had been under capable conservative treatment for over four years. There was a marked kyphosis in the dorso-lumbar region. These x-ray pictures were taken in January, 1928. They show clearly the disease in the dorso-lumbar region and the bone graft can be distinctly seen. The length and bulk of the graft, after being in position fourteen years, shows unmistakably that it has become an

intrinsic part of the spine and has grown concurrently. The photographs of this patient's back certainly do not suggest any distortion as a result of the grafting performed when he was a child, but on the contrary the kyphosis is barely noticeable. (See Figs. 1 and 2). This patient plays baseball and rugby.



FIGS. 1 and 2.

An almost more striking change of sentiment is making itself felt in the treatment of tuberculosis of the hip and knee. Dr. Russell A. Hibbs, Surgeon-in-Chief to the New York Orthopaedic Dispensary and Hospital, an institution which was founded on conservative orthopaedic surgery, and in which mechanical methods have been developed to the highest possible efficiency, has recently shown that only a small proportion of cases of tuberculosis of the spine, hip or knee, are really permanently cured by conservative treatment, even when carried out in an excellent general environment including the use of heliotherapy. His statistics are at once convincing and discouraging as regards conservative methods. He says: "Relapses occur, ten, fifteen and twenty years after the treatment has been discontinued and the cases have been classified as cures." He further states: "There can be no doubt that many cases have been classified as quiescent which were not so, and many classified as cured which were not cured. So many so-called quiescent cases have been found at operation to have very active disease, although living comparatively active lives, that thus far we have no trustworthy evidence of inactivity in this disease. Certainly the condition of the general health is no guide. We have observed case after case of hip-joint tuberculosis in children at the Country Branch whose general

appearance from every point of view was that of robust health, but who showed unmistakably the steady progress of the disease in its destructive effect upon the hip-joint. This has occurred in spite of the fact that they had the advantage of exposure to the sun's rays for about eight months of each year, which brings up the question of the influence of heliotherapy on joint tuberculosis. There is no evidence yet to prove that heliotherapy has any particular influence upon the progress of the disease, and there is grave danger that the belief that it does so, which is so generally accepted, may delay the proper study of this disease for another decade." Dr. Hibbs has been so impressed with the difficulties of exact diagnosis in joint tuberculosis, and with the vitiation of statistics of so-called cures as a result of wrong diagnosis, that he now refuses to treat a case for tuberculosis of the hip until the diagnosis has been established by aspiration and guinea-pig inoculation, or by exploratory operation. My personal experience, although much more limited than that of Dr. Hibbs, supports his contention. It is not so many years since we learned to distinguish between Perthes' disease and tuberculosis of the hip. Perthes' disease always results favourably, even when treated indifferently or not treated at all, and we now know that many cases of reported triumphant cures of hip-joint tuberculosis by conservative measures, the patient recovering with almost perfect function, were not cases of tuberculosis at all, but cases of Perthes' disease. I have been so impressed with the uncertainty of permanent cure by conservative measures in tuberculosis of the hip and knee that for many years past I have regularly taught my students that the only safe tuberculous hip or knee is the one in which bony ankylosis has finally occurred, and that this is the desirable outcome.

It was his dissatisfaction with the results of the older methods of treatment which led Dr. Hibbs to devise his fusion operation for Pott's disease. Later, in 1926, he described to the American Orthopædic Association a method of extra-articular fusion of the hip, which he had practised in a considerable number of cases with the result of curing the local condition in a short time, the rapidity of cure being comparable to that which was brought about by his fusion operation on the spine. Stimulated by this report other surgeons have devised

other, and perhaps simpler and even more efficient, methods of bringing about bony fixation in the hip; and in the writer's opinion these operations have been so perfected that some form of fusion should be employed in most cases of tuberculosis of the hip in children past five or six years of age. In some of the more destructive cases in young children it is better in my opinion to do first a rapid excision of the diseased head of the femur and the softened portions of the acetabulum, an operation which can be completed in a few minutes by using the Kocher approach to the hip. The immediate relief of pain and the rapid improvement of health which follows this preliminary excision is sometimes very striking; it is just as if a crushing load had been lifted from the patient's enfeebled system. Later, after this recovery of health has occurred, permanent fixation of the joint in the most favourable position should be brought about by one of the methods of fusion.

What has been said about the change of opinion regarding the best treatment of tuberculosis of the hip applies with equal force to tuberculosis of the knee. Such operations as erosion and excision of this joint in children were tried many years ago, but were largely abandoned owing to the deplorable shortening and frequent deformity which resulted from interference with the epiphyseal cartilages of the tibia and femur at the time of operation. For many years I have taught that in adults excision should be performed in all cases as soon as the diagnosis was fully established. My practice was based on observation of the fact that such a large proportion of these patients were finally forced to submit to radical operation after wasting years, often of the most valuable and productive period of their lives, in fruitless efforts to have a cure effected by conservative measures. In my own practice excision was gradually extended to the severer cases in children, and I am now fully convinced that, except in the mildest cases, a well-performed resection of the joint is the best treatment even in children as young as eight or nine years. If the operation is done early, before much destruction of the epiphyses has occurred, the removal of a very thin slice of bone from the condyles of the femur and the head of the tibia, without invading the epiphyseal lines, will expose sufficient raw bony

surface to assure bony ankylosis, especially if the plan of using the patella and flaps raised from the sides of the condyles as bony bridges across the front and sides of the joint be employed. This method of excision was fully described by me in a paper which I read before the American Orthopædic Association and which was published in the *Journal of Bone and Joint Surgery* in November, 1917. (Figs. 3, 4, 5, 6, and 7 are illustrative). I grant

of these secondary distortions a few years later, should they occur, by removing a wedge from the ankylosed joint, is such a simple matter that the possibility of their occurrence has ceased to worry me. All that is necessary is to warn the parents of the child in advance that such irregular growth may possibly occur and require a small secondary operation at a later date.

To sum up. My personal judgment is that a

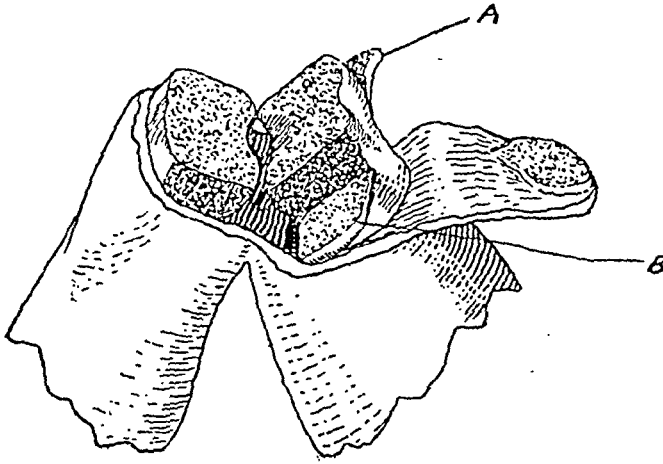


FIG. 3.—Joint widely opened, articular surfaces of tibia and femur removed after raising bone flaps A and B from lateral aspect of condyles; sides of head of tibia denuded; articular surface of patella removed.

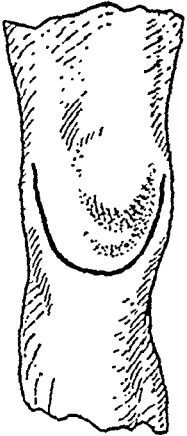


FIG. 4

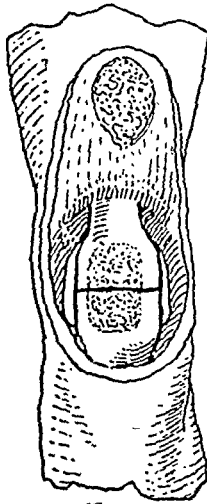


FIG. 5

FIG. 4.—Initial incision. FIG. 5.—Showing denuded surface on anterior aspect of tibia and femur to which patella is to be nailed; also lateral bone flaps in final position.

freely that no matter how carefully the operation is performed in young children irregular epiphyseal growth sometimes occurs afterwards, producing such deformities as flexion, genu varum, genu recurvatum, or a combination of some of these. Such deformities have happened in my own hands, but the correction

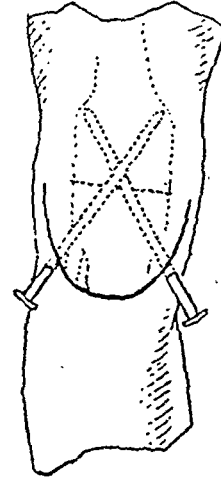


FIG. 6.—Tibia nailed to femur.

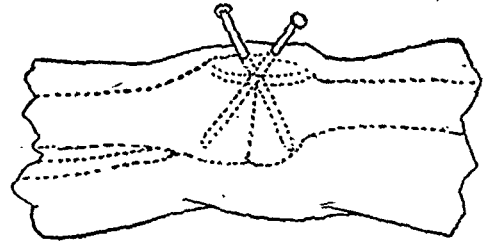


FIG. 7.—Patella nailed in position across femur and tibia.

tuberculous spine, hip, or knee is rarely safe unless and until permanent fixation has occurred, and that modern fusion and ankylosing operations have been developed to the point where they may be employed with practical safety and certainty even at a comparatively early age. By substituting these more modern methods for the tedious and uncertain treatment often employed, much suffering, inconvenience and expense are saved and patients are restored to relative health and efficiency in a fraction of the time formerly required, and serious complications, such as abscesses, and secondary infection, can often be avoided. The economic advantages are so obvious as not to require discussion. In pre-Listerian times, however, such operations would have been too dangerous to be attempted.

CONGENITAL DISLOCATION OF THE HIP

One of the triumphs of modern orthopaedic surgery is the successful treatment of congenital dislocation of the hip. It is only since about the beginning of this century that this condition has been regarded as curable. Some form of manipulative reduction is still employed by the majority of surgeons, but the open operation is steadily gaining in favour and being more and more largely employed. The late Harry M. Sherman, of San Francisco, was the first on this continent to perform the open operation in a fairly large series of cases. The writer has used the open operation exclusively during the past eighteen years and could not be induced to return to the distracting uncertainties of the older method of manipulative reduction. One of the interesting develop-

pelvic attachment and sewing it over the head of the femur, implanting the head, covered by the capsule, into the newly formed socket. The outside of the capsule grows fast to the new socket, forming a most satisfactory lining; and as the interior of the capsule is furnished with synovial membrane this ingenious method creates a new articulation having all the elements of a stable and movable joint. Many surgeons have tried the plan of reaming out a new acetabulum and implanting the head into the raw cavity, but nearly all of such operations have resulted in more or less ankylosis; so that while stability has been secured mobility has been abolished or greatly curtailed. The new operation proposed by Hey Groves has to stand the test of further experience, but it is one of those surgical procedures which appears to be at once sound and reasonable.

Thus within a few decades a deformity which was considered hopeless, even in young children, is being brought more and more under control in the case of older children and adults, by operations which could not have been attempted in the pre-Listerian period.

SYNOVECTOMY

An operation which seems to be steadily gaining in favour is synovectomy as applied to the knee joint. There are conditions of chronic knee-joint trouble, characterized by a thick, pulpy condition of the synovial membrane, which cause the patient marked discomfort and disability. The disease is neither tuberculous nor specific, and the exact pathology is often obscure. In some cases villous fringes and folds are a marked feature. The writer has in mind a recent case where a young woman of twenty-two years had been complaining of one of her knees for over a year, the condition gradually growing worse. The joint was painful after exertion, so that sometimes she could hardly use it; there was noticeable swelling and some local heat. Rest in bed failed to cause appreciable subsidence of the swelling. Finally, full exploration of the joint by the patella-splitting method was decided upon. The entire synovial membrane was found thickened and villous; it was of a dark purplish color, and in appearance and consistence was not unlike liver or placental tissue.

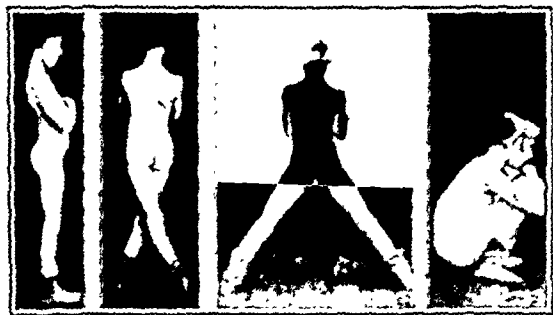


FIG. 8. FIG. 9. FIG. 10. FIG. 11.

Congenital dislocation both hips. Left hip reduced by open operation September 2, 1919; right reduced January 24, 1920. These photos were taken April 3, 1926,—more than six years after operation.

ments in the treatment of this deformity is the gradual evolution of operative methods in the management of the neglected cases so often seen in older children and adults. Actual reduction in many of these is impossible, and the surgeon must choose between letting them alone or attempting to improve the patient's condition by some kind of surgical compromise. Turning down a shelf of bone from the ilium so as to provide a solid support above the dislocated head is a very useful procedure and will materially benefit a considerable proportion of the older patients; and is also usefully employed in younger patients when the acetabulum is so shallow as to permit the head to become redislocated after it has been reduced. A most ingenious operation has recently been proposed by Hey Groves. Briefly, this consists of reaming out a new acetabulum on the ilium, and then, after detaching the capsule from its

The whole of the diseased membrane was carefully dissected away, and in a few months the patient had regained practically full movement. The pathological report was: "Chronic inflammatory tissue with some evidence of recent inflammation; no sign of tuberculosis."

About a year later the patient's other knee became similarly affected and was dealt with in the same way with an equally good result. I have seen the same condition in one knee of an adult of about forty years. In many cases of chronic synovial thickening conservative treatment fails and radical synovectomy appears to be the only means of cure. To do the operation satisfactorily, complete exposure of the joint by vertical splitting of the patella, ligamentum patellæ, infrapatellar fat pad, and that part of the quadriceps covering the suprapatellar pouch is essential. But how could such a radical procedure be attempted were it not for Lister's discovery?

While speaking of operations on the knee I desire to enter a protest against the too prevalent teaching that entering the knee is comparable as a surgical risk to entering the abdomen. I doubt if any part of the body is so intolerant of infection as the knee joint. It is true that one sometimes sees the knee opened, either accidentally or by a surgeon using only indifferent aseptic precautions, and no harm follows; but he who enters this joint habitually and frequently, feeling that it will take care of infection as successfully as the peritoneum, is merely inviting disaster. The opening of the knee is always a serious surgical responsibility. The most careful preliminary disinfection of the skin and a completely contactless technique must be scrupulously observed. The surgeon who invades this region should persuade himself that there is no margin for mistakes or carelessness, and that his asepsis must be, at least theoretically, perfect, in the laboratory sense.

FRACTURES

It is quite foreign to my purpose to discuss the controversial point as to whether fractures belong to general or to orthopædic surgery. The truth is that they do not belong exclusively to either. It is a matter of medical history, however, that orthopædic specialists have made some of the most notable contributions to the management of these injuries; and inasmuch

as the treatment of fractures constitutes a large part of the practice of every modern orthopædic surgeon, and also because in some hospitals the fracture service is largely under the supervision of the orthopædic department, a discussion of these injuries could not fairly be considered out of order in a paper with an orthopædic setting. The temptation to discuss at some length bone-grafting, skeletal traction, internal fixation with plates, etc., is strong; but the time at my disposal makes severe curtailment imperative. It would be easy to occupy all my time by a discussion of bone-grafting alone, for the subject is both important and fascinating, but I shall content myself by trying to answer one question which is often raised, namely,—After how many months or years of non-union may a bone-grafting operation be undertaken with reasonable hope of success? For practical purposes no time limit exists. Strong bony union was secured in one of my patients by bone-grafting after fourteen years of non-union of both bones of the forearm. In another patient, after three operations to overcome non-union of the humerus had failed, success followed using a portion of the whole shaft of the fibula as a graft, this being supplemented by osteoperiosteal grafts from the tibia applied circumferentially.

I shall dismiss further discussion of the subject of fractures by a brief reference to two contributions by well-known surgeons whose practice is exclusively orthopædic. In treating many fractures of the femur and some of the leg the Thomas splint is almost invaluable. Unfortunately, however, the pressure of the ring is not only uncomfortable but is very apt to cause pressure sores. This difficulty may be entirely overcome by employing a little known method of traction originated by Michael Hoke, of Atlanta, Georgia. Into a short plaster spica which surrounds the pelvis and upper part of the thigh on the injured side are incorporated the upper ends of the side bars of what is practically a Thomas splint minus the ring. The thigh portion of the plaster is little more than a wide collar, and its upper edge must not come within a couple of inches of the perineum. The plaster is also carried down on the opposite extremity so as to include the foot, which is placed at right angles to the leg. In the case of young children

traction may be applied by the usual adhesive strips, but skeletal traction is preferable in older children and in adults. Calipers may be used, but my personal preference is for a pin passed through the femur just above the condyles or through the lower part of the tibia or the os calcis. The degree of traction can be accurately controlled by a butterfly nut arranged on a screw, as shown in the illustration. As soon as traction is applied it tends to push the whole plaster dressing up on the patient's body, but the plaster cannot move upward owing to the inclusion of the opposite limb. Thus perfect resistance is provided and all counter-pressure comes against the broad sole of the foot, a surface which is not only adapted to pressure but accustomed to it, instead of being secured by the ring of the Thomas splint pressing against surfaces not so well adapted to pressure. This method of securing extension I have found invaluable, not only in fractures but in certain other conditions. The pin through the bone, if aseptically introduced, causes neither trouble nor pain.



FIG. 12.—Michael Hoke's method of traction.

The other matter to which I wish to direct attention is the Whitman reconstruction operation for ununited fractures of the neck of the femur. There is much difference of opinion as to the proper treatment of this condition; but Whitman's operation is undoubtedly a valuable aid in many cases, providing stability, a good range of movement, and almost perfect muscular control. My experience with this operation is limited but on the whole favourable. Instead of exposing the hip by the incision employed by the author of the operation,

my personal preference is for the Kocher approach to the hip, but this is a mere detail.

CURVED OSTEOTOMY

The deliberate cutting through of a bone and placing the ends of fragments in such relation as to correct deformity must have appeared a bold surgical procedure to the surgeons who first carried it out. It is said that Lister was the first to perform such an operation for genu valgum. Osteotomy has long been recognized as an extremely useful operation, which has its chief application in the correction of knock-knee, bow-legs, ankylosis of the hip in a bad position and malunited fractures. Formerly, so-called subcutaneous osteotomies were the rule, and in the earlier years of my practice I habitually performed these operations through an incision only large enough to admit a narrow chisel. This subcutaneous method is an inheritance from the time when surgeons were more or less afraid to inflict wounds because of the danger of infection, and in my opinion it has no place in modern surgery. An exposure sufficient to enable the surgeon to see what he is doing is not only more scientific but less risky. Linear osteotomy and cuneiform osteotomy are well known, but the curved osteotomy first proposed by R. G. Brackett, of Boston, seventeen years ago, although little known, is better and safer in a considerable proportion of all cases where osteotomy is indicated. Brackett first proposed this curved incision through the bone—which he called the “curved Gant”—as a substitute for the subcutaneous linear osteotomy commonly performed to correct flexion and adduction deformity at the hip. His paper is illustrated with x-ray pictures showing most unsatisfactory relation of the fragments in many of the cases treated by the older method. These illustrations make it plain that the fragments frequently slipped past one another and sometimes assumed the most extraordinary and bizarre relation. With full exposure of the upper part of the femur through a long external incision and retraction of the soft tissues, an approximately semicircular intertrochanteric section of the bone can be made by a very narrow osteotome, and this enables the operator not only to correct the deformity but to make certain that the fragments are so securely

locked together that they will remain where he has placed them. The same curved section of the bone is altogether preferable to the linear or cuneiform section in the correction of bow-legs and of many malunited fractures.



FIG. 13.—The usual linear osteotomy.



FIG. 14.—E. G. Brackett's curved osteotomy.

RECURRENT DISLOCATION OF THE SHOULDER

Recurrent dislocation of the shoulder has always been a difficult surgical problem. The older operations of reefing the capsule have rarely been permanently satisfactory, especially in the case of men engaged in occupations requiring strenuous use of the arms. The Clairmont operation of supporting the stretched and weakened inferior part of the capsule by detaching the posterior quarter of the deltoid from its insertion, bringing it forward through the quadrilateral space and sewing it to the

coracoid process and the coracobrachialis, or to the anterior border of the deltoid, was until recently the most successful method of meeting the condition. The immediate results are excellent, and in many instances, especially in patients not given to strenuous activity, are probably often permanent. However, I have observed relapse in some cases of my own as well as in those operated on by others, and failures have been noted by other writers. A real difficulty is that the detached portion of the deltoid is rarely long enough to reach the coracoid process, and attachment elsewhere is less satisfactory. At the post-mortem examination of a patient upon whom this operation had been performed, and who died later of another affection, the anterior attachment of the transplanted deltoid presented the appearance of a precarious, insufficient, atrophied band.

Hey Groves in 1925 described a most ingenious, simple, and satisfactory method of dealing with these recurrent dislocations. Three short incisions are required. To quote from the author's article: "The first incision is in front below the tip of the coracoid process, and through it all the structures are separated down to the front of the shoulder joint covered by the tendon of the subscapularis. The second incision is behind the posterior border of the deltoid, and is deepened by blunt dissection down to the posterior aspect of the shoulder joint covered by the short rotators. A tunnel is now made connecting the depths of these two incisions, so that a long pair of forceps can be passed from one to the other, keeping close to the inferior part of the capsule. The third incision is made above, over the superior surface of the acromion process. From this tunnels are made joining the first and second incisions but keeping deep to the deltoid muscle. A strip of fascia lata eight inches long by two inches wide is taken from the thigh. It is folded into a band about two-thirds of an inch wide, and is drawn from the anterior to the posterior incision and then its two ends are drawn up through the superior incision and drawn as tight as possible. The two ends are made to overlap, sutured together and to the tissues covering the acromion." Feeling that a bony anchorage for the fascial sling would afford greater security in the few cases which I have done, the plan was adopted of drawing the ends through a tunnel made in the

acromion by means of a small chisel and curette.

This operation is much easier to perform than the Clairmont, leaves the deltoid and all other muscles intact, requires only small wounds about the shoulder, can be performed in less time, and recovery of free, painless movement is more rapid. In my opinion it is much the best method that has been proposed for the management of this troublesome disability. I have performed it in two cases which had relapsed after the Clairmont operation; and Hey Groves refers to one of his patients upon whom a previous Clairmont operation had been unsuccessful, and who returned to his work as a "blacksmith's striker" within three months and had continued at his work for a period of nearly two years.

DEFORMITIES AND DISABILITIES RESULTING FROM PARALYSIS

It would be interesting to follow some of the more recent advances in the surgical treatment of disabilities resulting from poliomyelitis and other forms of paralysis, but only the briefest mention can be made of two or three things. Stabilizing operations on the feet, such as triple arthrodesis and Whitman's method of astragalectomy, have emancipated thousands of patients from cumbersome and unsightly mechanical appliances; inequality of the limbs can be overcome either by shortening the long extremity or by lengthening the short one, thus abolishing the humiliation of having to wear a thick-soled shoe; and improved applications of the principle of tendon and muscle transplantation have greatly reduced the handicaps of many paralytic patients. One of the most striking of these transplantation operations is seen in the treatment of traumatic musculo-spiral paralysis. By transferring the insertion of the pronator teres to the extensors of the wrist, and the flexor carpi radialis and flexor carpi ulnaris to the extensors of the thumb and fingers, the improvement in function is sometimes so unbelievably great as to make both surgeon and patient feel that destruction of the musculo-spiral nerve is far from being an irreparable misfortune.

Instead of exhausting the list of triumphs which Lister's discovery made possible in the orthopædic field I have merely touched the fringe of the subject. Enough has been said, however, to bring once more to our remembrance the fact that Surgery must forever owe to the genius, the vision, the faith and the tireless industry of our great Lister a debt that is not merely vast but infinite.

Where is there a surgeon who, could such a choice be given him, would not rather have been Lister than Shakespeare? Where is there a surgeon who does not think of Lister as an outstanding figure in that small circle of great medical benefactors whose combined achievements have brought to suffering humanity comfort of body comparable to the comfort of soul made available to our race by a certain Nazarene?

No one would question that Lister was a man of clean hands, figuratively as well as literally. No one doubts that his character was above reproach, that he was, in the widest sense, a man of pure heart. No one could imagine that simple, dignified, sincere nature tarnished by anything so unworthy as vanity. No one could look upon that frank, noble countenance and think it possible that such a man could be guilty of falsehood, misrepresentation or deceit. And it does not strain the imagination to suggest that in uncovering the dark secrets of wound infection Lister mounted to a divine height and became an agent of the Almighty. Therefore I would choose, as a kind of dedicatory inscription to my address, words from the twenty-fourth Psalm, which I shall allow my fancy to regard as having a prophetic application to this great soul: "Who shall ascend into the hill of the Lord? or who shall stand in his holy place? He that hath clean hands and a pure heart; who hath not lifted up his soul unto vanity, nor sworn deceitfully."

"Nothing can cover his high fame but Heaven;
No pyramids set off his memories,
But the eternal substance of his greatness,—
To which I leave him."

A HEREDITARY ECTODERMAL DYSTROPHY*

By H. R. CLOUSTON, B.A., M.D., C.M.,

Huntingdon, Que.

THOUGH extraordinarily rare, according to medical literature, the form of hereditary dystrophy of the hair and nails about to be described, is comparatively a commonplace in this part of Canada, where it is peculiarly associated with the French race. In fact all the cases reported on the American continent have been of French Canadian origin. The only other families referred to in the literature are not only from France but from that section whence came the early settlers to Canada. One can infer a common familial and individual source at some time more than 170 years ago (previous to the Battle of The Plains of Abraham in 1759) That it is not a racial but a familial trait is shown by the fact that the defect readily carries over into German, Anglo-Saxon and West Indian admixtures. The group reported from Buffalo, N.Y., by Jacobsen¹ is a direct branch of our family. Including his cases with ours we have not only the largest family group described (119), but considerably more than all others combined. Of the family about to be reported upon, 40 have been inspected, some closely and some casually. This, also, is a larger number than the combined total of cases seen by all the other writers.

The supposed rarity of the condition seems most astonishing to those of us who recognize it. I know of at least three other family groups which between them would add another hundred or more cases. A study of Chart I shows that on the average each affected individual passed on the defect to three others. A simple calculation would indicate that there are at least six thousand in America, (three to the eighth power).

Constant features are heredity and nail dystrophy.

HEREDITY

Through unusual circumstances I have seen

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members of five generations. Two who are great-grandfathers have been examined. These can give information about their grandmother who was the most remote sufferer from the defect about whom we can obtain a history. She had five children with the dystrophy. One daughter is the ancestress of Jacobsen's group. One son is the head of the group which I can check and cross-check closely, having seen more than half of them. On another son only partial information is readily available, but such as it is, it has been included in the chart. I have excellent reasons for believing that the remaining son and daughter are represented by two groups about which I have some information, but, lacking complete identification, they are not included in any way.

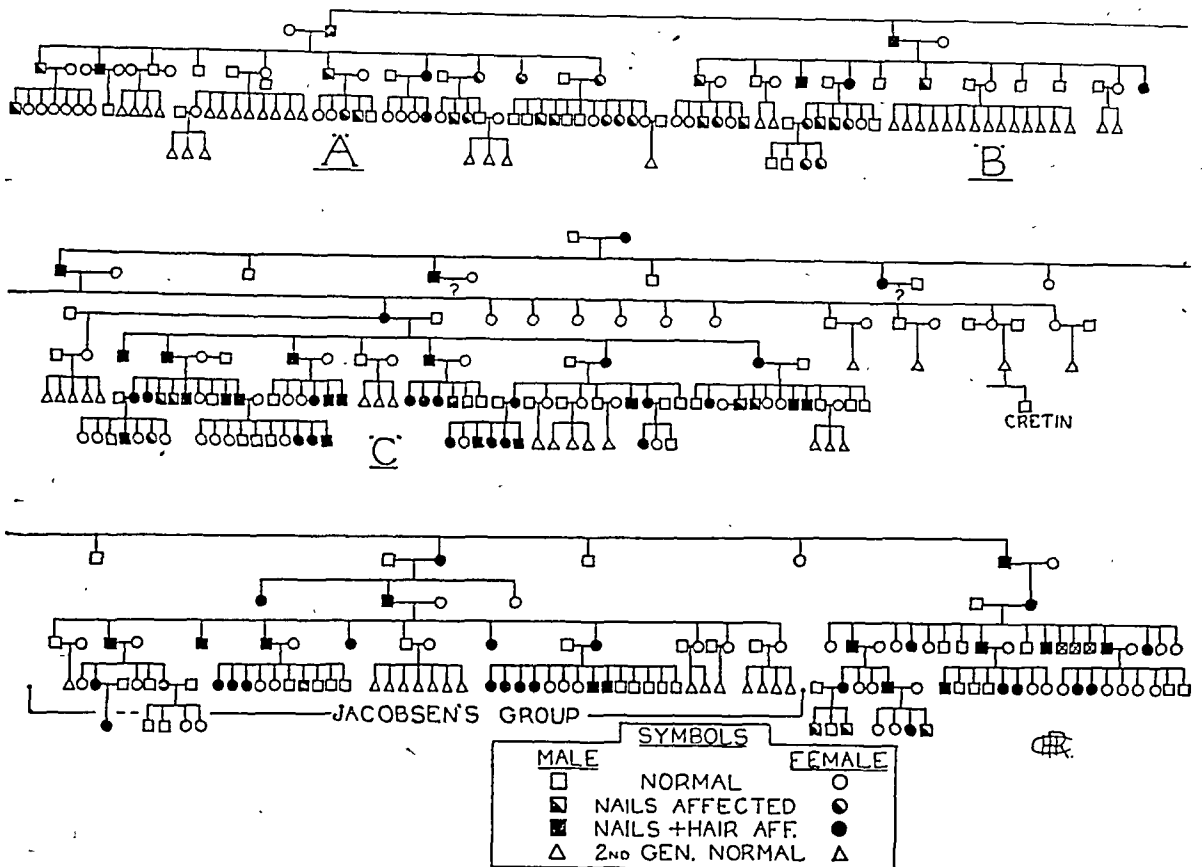
There are 118 descendants of the original woman shown by the incomplete chart to have had the dystrophy.

Sex of Cases		Parent Affected	
Males	Females	Father	Mother
57	61	60	58
Children in Groups A, B, C. only			
Defective Fathers		Defective Mothers	
83 children		82 children	
38 defective		41 defective	

In other words males and females are equally affected; males and females transmit it equally; and one-half of the children of defectives are defective. It therefore follows the law of a Mendelian hybrid, not sex linked, the defect being a dominant.

Practically always the mating of an affected person with a normal gives a mixed progeny. The apparent exceptions present no difficulty to the students of chance and probability. If a child escapes the defect, he and his heirs are free forever. It never jumps a generation. Moreover, even where the normal child of an affected parent marries the normal child or normal grandchild of an affected person the dystrophy does not return. Neither does it increase the dystrophy in the children when the affected person marries a normal who is de-

CHART I



The three sections fitted together from left to right form a single family tree. No attempt has been made to chart any normal line after the 2nd generation, and in some instances the single triangle represents a whole family of normals. In no case has the dystrophy occurred in the family of "normals".

scended from a defective. We have instances illustrating all three. As a dominant it is either visibly present or wholly cast out.

White² has reported a group in which it was said that there was one instance where the normal child of an affected parent was the father of a defective child. Thompson,³ in the case of a familial nail dystrophy, also reports an alleged instance of reappearance of the defect. Neither White nor Thompson were able to confirm this personally. We also ran across an alleged instance, only to find on inquiry that a wife had given misinformation about her husband. A learned and philosophical member of the affected group, who had made some study of the family, laid it down as a law that normal parents never begat defective children, and if it appeared to be so, there was evidently "a cuckoo in the nest."

There is a belief among them that the condition tends to die out, both as to the number affected and its severity. There is much evi-

dence to support this in the case of some groups. On the other hand there are at least three instances where the children have a more severe grade than the parents. There are also cases in the sixth generation in which the dystrophy is nearly as severe as it ever was, and families where the proportion is just as great or greater. (See group "C").

The condition is not wholly characterized by any fixed signs or symptoms, and the difference in the clinical findings noted by the various reporters seems partly due to their scarcity of clinical material, and partly to the great variety of forms in which the interplay of many factors permits them to be expressed. One sees every degree of defect. They themselves divide the afflicted ones into two groups, *viz.*, (1) those with "bad nails and bad hair", and (2) those with "bad nails only". On close examination of a large number this is seen to be inaccurate. Members of the family will disagree on the classification of certain border line cases, and actually

there is every grade of the condition to be found. The individual who admits that he is in the first class either wears a wig or other head covering constantly, except when in bed. A few have the moral courage to disregard this custom.

We shall take up the subjects under separate headings, as The Nails, The Hair, The Eyebrows, etc.

THE NAILS

No case has been counted among the dystrophic ones unless the nails were involved. The toe nails are always affected when the finger nails are. As Nicolle and Hallipré¹ noted, the nail defect is more persistent than that of the hair. This suggests that certain familial nail dystrophies may really be milder expressions of the same condition. (e.g., Thompson's cases were found to be of French origin).

Microscopic examination of scrapings has proved negative for mycoses in our cases as well as in all others recorded. Moreover, the distinctive condition can be recognized in the newborn child.

The nail defect varies enormously and several degrees of dystrophy are frequently found on the same hand. As might be expected in an hereditary condition there is a tendency towards a symmetrical arrangement. In the mildest condition noted the nails were merely thickened and slightly discoloured, striated longitudinally, and, if long, were bent forward at the finger-tip like a beginning claw. The appearance is little different from the condition seen on the hands of those whose nails are subject to trauma, but the growth, if any, is extremely slow. It is common to find one or more of this grade even in the severest cases. In only one case were they all of this class.

A second grade shows a concave free edge behind the normal line and great convexity from side to side. In infancy the nail may be milky white and thick, as though watersoaked. In early childhood the surface layers of the nail seem to be more concentrated and normal, but bulged from beneath by imperfect horn. If the nail is long it will be found that it is really separated from the nail bed for at least the forward one-third and for varying distances farther back as the condition is more severe. Some of those affected state that this forward bayonet-like projection naturally tends to ac-

cumulate dirt, and that it is liable to catch on things and be torn backward, with resultant infection. They say that they keep their nails trimmed back to the nail bed. Trimming is very seldom necessary. The forward part may seem to dry and wither and show a distinct line of demarcation from side to side. (This is possibly the result of the action of soap, water, the elements, and trauma on both sides of a nail which is growing extremely slowly). In a seven year old boy a crack appeared along this line and the withered portion fell off. The sharper border then tends to wear off and may result as shown in Fig. 1.

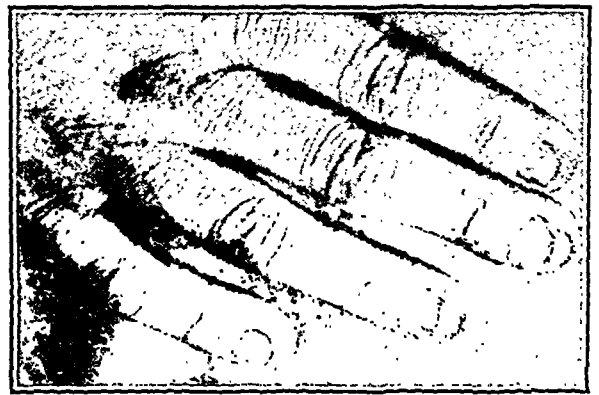


FIG. 1.—Mild form of nail dystrophy associated with good hair.

In a more severe grade there is a central ridge which runs forward and upward. The nail may be split along this ridge, as seen in Fig. 2. In some cases the underlying debris seems to have escaped and the divided portions lie flatter. If the separate pieces grow they may curve forward in opposite directions, or, if they do not, there may be only short tags of nail at the root. Some of these defective nails are very deeply pigmented.

A still worse grade shows only a pigmented fringe of nail bed around the nail grooves, or there may be only cicatricial tissue where the nail should be. (Fig. 3).

Defective nutrition, becoming progressively worse the greater the distance from the lateral vessels, might explain the slower central growth and the consequent concave free edge and also the central splitting. Defective nutrition is also displayed in the proneness to sub-ungual inflammation as the result of slight trauma. This condition is very slow in healing. Nicolle and Hallipré were greatly impressed by the vile stink which is a constant feature of this suppuration.

The victim can readily agree with Lady Macbeth that "All the perfumes of Arabia will not sweeten this little hand." As a means of fighting the Devil with fire, iodoform is preferred by some, but thymol iodide, etc., are very useful. There is a persistent belief among these families that about puberty there is a change from the nails of childhood towards the condition which they will assume for the rest of life. They say that there is more inflammation about this period and that the nails come off, break off, or split,

etc. Observation tends to confirm this statement. This may be due to the increased liability to injury as the older children begin to work. If however the condition has an endocrine association, as some believe, this may have some significance. Inflammation is much less frequent after the age of twenty-five than before it. Wholly unconfirmed is the idea held by some of their fellow citizens that the attacks correspond with some phase of the moon or menstrual cycle.

THE HAIR

According to their own classification of themselves (largely followed on the chart), about one-half of the patients have good hair. They are nearly half right. About 20 per cent of those inspected showed no discernable dystrophy of the hair. They range in age from 3 months to 16 years. It is worthy of note that in those inspected no individual over sixteen years of age who had dystrophy of the nails failed to show some of the hair also. It is quite possible that some of those now considered normal will not be so classed as they grow older. On the other hand, it gives support to the belief that there are some forces at work tending to make the condition "run out." They say that their hair does not wear well. The growth at best is very slow, and when the destruction due to wear overtakes the replacement power the defect appears. In the mildest condition the hair, though fine in texture, seems normal on the top, the front, and the sides, but somewhat shorter, finer and more lifeless from the occiput down the back of the neck. To girls of this grade the modern method of hair dressing known as the "Boyish Bob" was a godsend. The short hairs could be equalized and the use of certain lotions would make the hair appear more normal. In a more severe grade there may be a bald spot from the occiput downward, with the edges passing gradually into more or less normal hair. Presumably this is just where the head touches the pillow. Practically always one can account for any patchiness by friction and wear. Where a complete wig is worn, the distribution of the short, sparse hair is often remarkably uniform.

There are successive gradations in which the hair is shorter and shorter and more sparse, until there is only a slight lanugo-like growth which may not be apparent a few feet away.



FIG. 2.—Note the clubbing of ring-finger.

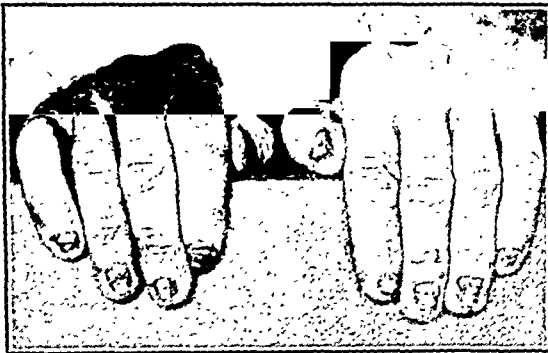


FIG. 3.—Severe grade. Note the absence of nails on some fingers.

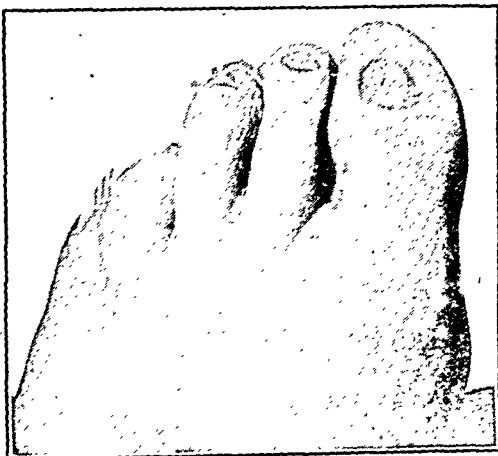


FIG. 4.—The toenails are always affected when the fingernails are.

In a few cases there was no hair of any kind. These are older people. They will usually give a history of "fever," or insist that the wearing of the wig is responsible for the complete baldness. It is to be understood of course that one grade does not necessarily pass into another, except as the hair may deteriorate in normal people and for the same reasons. The youngest child may be almost completely hairless and remain so, as shown in the family history, for 113 years.



FIG. 5.—A common hair condition.

French Canadians as a rule are dark haired people, although there is also a blond strain, derived probably from the Norse vikings who swept Northern France and mingled there with the dark haired Franks. In this family there is an unusually large proportion of blonds, as was true also of the cases of Nicolle and Halipré of Rouen. This blondness, when present, accentuates the apparent amount of the dystrophy—the blond fine short lanugo-like hair being almost invisible (Fig. 6). It is not an essential part of the dystrophy, however, as is shown by the fact that there are some good heads of golden hair in children showing the nail defect, and also by the fact that some of the most marked cases have dark pigment in the lanugo-like hair. Indeed, in some instances, the scalp of a victim would be absolutely interchangeable with the skin from

the leg of a normal brunette. It is a blondness and not an albinism.

The hair is very fine and is rather dry and brittle. Microscopic examination shows only a fine hair, otherwise normal. Some writers have found that the hair pulls out very readily. This is not a feature of my cases. There is also the statement that the hair falls out at eight or nine months and never returns. Experience with this family would indicate that this is merely a shedding of embryonic hair



FIG. 6.—A boy of the sixth generation.

which occurs frequently in normal babies as a normal process. Many of this family have the extreme form of dystrophy from birth.

THE EYEBROWS

The eyebrow condition is perhaps the most striking feature of the dystrophy. The head may be hidden by a wig or hat. The nails are so instinctively hidden that those in close contact with the sufferers may never see their deformities. But the eyebrows proclaim to the initiated not only the condition but the extent thereof. In hyperthyroidism the eyebrow is

frequently thinned in the outer third. In this condition, with extremely rare exceptions, it is thinned in the outer two-thirds. Usually this section is thinned so much that it appears absent at a short distance and often is missing altogether. The condition of the inner third indicates with fair accuracy the amount of hair on the head. When there is hair, the dividing line between the inner and the outer two-thirds is usually quite abrupt (see Fig. 7). This line



FIG. 7.—The eyebrow sign. The eyebrow stops abruptly at the supra-orbital notch. Note the pigmentation of the knuckles.

corresponds to the supraorbital notch which carries the artery, vein, and nerve, and is presumably an embryological division. Eisenstaedt's pictures show this division, but no writer seems to have noted the exact line.

The eyelashes are small and few in number, corresponding to the general condition. Sometimes they are entirely absent.

The pubic hair holds its normal proportion to that of the head. It is sometimes entirely missing. When present, is usually of the female type of distribution—confined to the mons—and may be compared to that of normal youths at the beginning of the pubescent changes. Axillary hair is present or lacking according to the condition of the rest of the body. On other parts of the body there is extremely little if any

growth. Occasionally a man with a quite severe type of the dystrophy shows a fair amount of hair on the chest, but ordinarily the lanugo hair is as conspicuously affected as the rest. In one case there was a thin moustache.

THE SKIN

Since the hair and nails are only appendages of the epidermis, one might expect to find further epidermal dystrophy. Since the one constant factor is the dystrophy of the nails and since the nails are merely thickened stratum lucidum, one would look for signs of it in those spots where the stratum lucidum is present, *i.e.*, the palms of the hands, soles of the feet, etc. In very few cases was it entirely lacking. This condition, like all the others, varies so greatly, and the milder grades shade into the normal so gently, that the observer must know what he seeks and where to find it. Tobias⁵ noted some thickening of the skin on the distal phalanges and the verrucous condition at the free borders of the nails. Eisenstaedt⁶ also noted this and an increase in volume of the same phalanges. He also noted a papillary hypertrophy and pigmentation in the axillary region and the anterior surfaces of the knees which was suggestive of acanthosis nigricans. None of the writers on the familial type of this dystrophy seem to have noted the very striking condition of many of the hands. Sutton remarks on the hyperkeratosis sometimes accompanying dystrophy of the nails and Gottheil,⁷ discussing Eisenstaedt's cases, says that it is evidently closely related to the hereditary type of hyperkeratosis of the palms and soles.

Nearly always there is a papilliform hypertrophy on the lateral and posterior surfaces of the phalangeal and metacarpo-phalangeal joints and the free edge of the nail. This also occurs sometimes on the elbows and knees. Frequently the whole palm and sole have an extraordinary appearance (Fig. 8). The natural lines are much accentuated. The furrows and ridges, when definable at all, are much coarser than normal and have some tendency to intercommunications, "like the bark of an elm tree." Over the remainder it would appear that the ridges were divided irregularly at right angles. When the papillary projections so formed are fine they resemble

the "pile" of a carpet and can be parted in the same way so that one can look down into the base. In the coarser forms the result is an irregular mosaic. Usually there is not the hard consistency about the surface which one would expect from the thickening. In one case with the severest dystrophy, in a man who was engaged in heavy manual labour, there was the appearance that the projections had worn off the bearing surfaces of the palms. It was present on the lateral and posterior surfaces

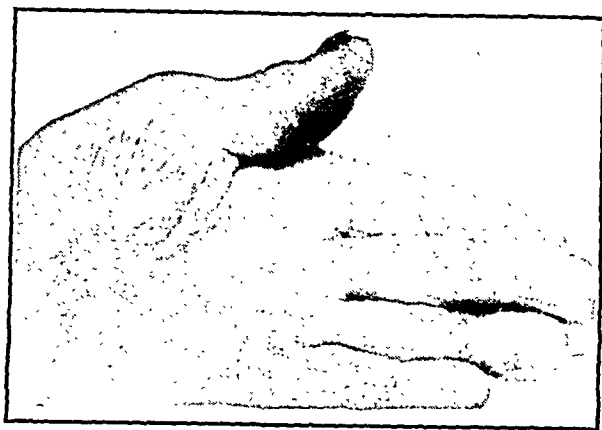


FIG. 8.—Hyperkeratosis; pigmentation; clubbing of fingers.

of the phalangeal joints. The resultant surface was abnormally smooth and the palms were curved forward as though by the contraction of scar tissue. There was the history of a cracking of the skin with infection.

The degree of skin alteration does not run absolutely parallel with the severity of the hair and nail dystrophy. It is more marked in the males than in the females and more in the adult than in the child. In the lightest case recognized as one of the dystrophic ones the hair was good (the eyebrows met across the forehead), yet the palmar condition was very marked. It is evident that here is the link between this dystrophy and the condition known as *keratosis palmaris et plantaris*.

It has not been possible to obtain a piece of the whole skin from these parts for microscopic examination, but in one case the surface layers were lifted from the sole of the foot of a boy by a large pustular bulla. The new soft skin underneath seemed nearly normal, and the change from normal to abnormal seemed to have occurred in the surface layer. In this separated piece the openings of the sweat glands were very large and appeared to be the

factor which divided the ridges into papillae. The papillae on the surface, therefore, do not represent the papillae of the corium which are much smaller. "A ridge is composed of two or more rows of papillae and the ducts of the sweat glands emerge between rows of papillae and open on the curved surface ridges." (Gray's Anatomy).

Apart from the skin of the palms, soles, phalanges, and occasionally the elbows and knees, there was no roughening elsewhere.



FIG. 9.—Microscopic section. Note the sweat gland which differentiates the condition from the MacKee-Andrews defect.

Indeed before middle age the skin seems to be of very fine texture. Its striking smoothness apparently is due to the absence of hair and follicles.

Clinically the sweat glands are very active. The female mammae (which are modified sweat glands) are unusually excellent. Some of the mothers nurse their babies for two years and more as a contraceptive measure.

It is difficult to judge the condition of the sebaceous glands macroscopically. The skin is dry. The hair is rather dry. Both sexes seem to be comparatively free from acne.

Through the courtesy of Dr. J. F. Burgess, a microphotograph of a section of the skin of the scalp is reproduced. The patient was a female, seven years of age, and a member of the sixth generation of this family. The section is from the mid vertex and shows the sparseness of the hair follicles and their small size. No sebaceous glands were found in any part of the specimen removed, but occasionally

there were clumps of cells in the appropriate position which might represent them in a rudimentary state. The sweat glands are relatively few in number, but definitely present and normal. The derma is thin and somewhat atrophic. There is absolutely no suggestion of myxœdema.

MacKee and Andrews⁵ have described and photographed a "Congenital ectodermal defect" which shows an astonishing number of similar characteristics, but there are also equally striking differences. In their cases there are no sweat glands and no sweating. In the dystrophy described here there is free sweating. The section shows a sweat gland (Fig. 9). Their cases have different racial origins, do not follow definite Mendelian laws in heredity, have papular skin on the face, and invariably have saddle-backed noses. In my cases there are smooth skins and there are some well marked Roman noses.

In this family a nail defect is constant and the tooth anomalies are relatively slight. In the other type the nail deficiencies are of a less severe form and are not constant, but the teeth are very markedly affected both in numbers and in conformation. Weech,¹⁸ in an article which was published since this paper was first read, calls the other type the anhidrotic form of ectodermal dysplasia).

PIGMENTATION

A characteristic often remarked upon is a colouring which suggests the orientals. This is not intense enough to attract great attention among people who work much out of doors, but certainly they tan readily with a peculiar tinge. In addition there is often increased pigmentation over the phalangeal joints and sometimes on the knees and elbows (Fig. 8). The nipple areola is usually relatively dark. There is frequently pigmentation in the axilla and about the genitals. In one patient a certain black appearance of the palms was subjected to washing with soap and water, gasoline, ether, and alcohol without effect. It seemed to be pigment. He also showed a roughness and deep pigmentation over the tuberosities of the ischium. Some cases show pigmented spots on the skin in other places and in one instance the only trace of an alleged burn was a yellowish patch about three by five

inches. One case showed pigmentation of the mucous membrane of the mouth. Many of the nails are coloured deeply. In many cases the teeth are poor and pigmented. There are some notable exceptions to this, however. Another striking feature in some cases is the extreme depth of colour of the iris. This is sometimes so marked that the pupil cannot be distinguished at a short distance.

THE TEETH

As a whole they have poor teeth, but there are some with the severest form of dystrophy whose teeth are very good. In one case there is dependable history of several of the second teeth failing to erupt. Occasionally there is wide spacing. In a year old baby which has been under observation since birth the teeth are erupting normally and there is seldom any history in other children of marked delay.

BODY CONTOUR

The majority of the victims are rather short in stature and light in weight, but they are not marked out in that respect from their normal brothers and sisters. In a few cases they are over the average in height. In less than 10 per cent is there anything suggestive of hypothyroidism.

Frequently there is a relative enlargement of the distal phalanges, both in length and breadth, even in children. This is most marked in the middle and ring fingers. In the adult, especially the male, this may become a definite clubbing and there is an increase in breadth, though the hands are usually small. In one man the hands might almost be said to show gigantism. In another the metacarpals and phalanges are disproportionately long (see Fig. 11). Kyphosis in the older males seems much more common than usual.

NERVOUS AND MENTAL CONDITION

In this, as in every other feature, there is enormous variation. Among those showing the severest dystrophy there is to be found a highly respected city clergyman, a nurse who served in France, the mayor of a village, a manager of a "go-getter" sales force for a large corporation, and a states trooper on the border patrol. It is scarcely necessary to point out that neither

religion nor learning, neither business nor political acumen, necessarily exempts one from the defects of an inherently weak nervous system nor the effect of endocrine imbalance. On two occasions an outstanding member of the group has required institutional treatment for a "nervous breakdown." On the other hand, in groups A, B, and C (80 cases) there are 7 frankly mental defective (9 per cent). One of these is an idiot. This is a female, who is short and thin, with small bones and a small head and practically hairless. Before being sent to an institution, at about forty years of age, she had never allowed shoes or stockings on her feet. She walked upon the toes and front part of her foot with her heels some inches from the ground. She would not sleep on a bed but curled up on the floor. She carried on a spiteful, senseless chattering. The other mental defectives as a whole are small, and seem to have a mental and physical asthenia.

Two of the mental defectives have strabismus. Strabismus was found 4 times in 80 in the group (5 per cent). In Jacobsen's group there were several who stammered. This has been noted once in this branch of the same family. Epilepsy is present in one case. Nicolle and Hallipré recorded these conditions and state that "they seem to indicate that the dystrophy of the hair and nails is not the sole stigma of decadence in this family of degenerates."

Barrett⁹ found a very high proportion of delinquency in his cases and also many neurological defects in members of the family who were free from the dystrophy of the hair and nails. The group that I have studied, on the contrary, is a particularly mild and harmless lot of citizens. Behaviour abnormalities in the normals are no more frequent than in the surrounding population. There is one mental defective and one cretin among the normals, but nothing like the conditions found in Barrett's cases. His photographs do not look like mine. He found a high proportion of myxœdema in his family. Employers of labour state that as a whole these people are under average for their purposes. Even here there is the exception who is better than the average.

To what extent the mental condition is due to the innate and hereditary ectodermic defect, and how much to the oppression on the part of

the rest of the human race, is a nice question to decide. One of the first anxious questions after birth is whether it is like the father or the mother. The pregnant neighbour woman turns from them for fear of marking her child. The young savages of the human species with exquisite cruelty chant nicknames and derisive rhymes. School boards sometimes require certificates that they are not diseased. The nail suppuration at times ostracises them from their own social groups. Imagine the mental effect of keeping the nails constantly in hiding. Strange workmen object to them being included in the gang, for fear of syphilis. Remember that their matrimonial opportunities tend to be restricted to those whose opportunities are also limited or to the more broad minded. It is difficult to calculate the effect of this selective breeding for generations. It is obvious that these people have not received a fair deal from man, and they wonder plaintively why God allowed them to come into the world "like that." They do best in occupations which do not call for too great exertion of any kind.

HEALTH CONDITIONS

Their infantile death rate is normal. They seem fairly resistant to infections, and they live to fine old ages. One woman is said to have been proved by birth certificate to have reached the age of 113. Two men, brothers, are 87 and 85. The former splits much of his own wood and is quite active generally. Their father died at 90.

There is absolutely no indication of syphilis and Wassermann tests have been negative.

ENDOCRINE GLANDS

Most writers suggest an endocrine origin. As there has been no histological or pathological work done, we here enter the realm of pure speculation, but an investigation of the evidence so far secured yields interesting, and hitherto unsuspected results. The various glands will be considered individually.

THE GONADS

1. *Female*.—Menstruation is said to have begun at 11 in one of the severest cases and also in one of the milder ones. Another mild case began at 16. No significant relationship could be made out between the amount of dystrophy

and the earliness or lateness of menstruation. The female form and the breasts develop normally. The desire for personal adornment is quite as great as among their normal sisters, and all the "flapper" instincts are quite as fully manifested. At least one was married before 15 years of age. Pregnancies are normal, and abortion or miscarriage is very rare.

2. *Male*.—In the male there are the regular voice changes and there is, sometimes, a slight growth of hair on the face and chest. The amount of hair which appears on the pubes is proportionate to that on the rest of the body, but it shows a tendency to assume the female type of distribution. One gains the impression that among the males there is some retardation



FIG. 10.—Ununited epiphyses in a boy in his 17th year. The dislocation of the radius is congenital.

of maturity. There is support for this idea in the x-ray examination of the hands of two boys in their seventeenth year. The epiphyses are abnormally widely separated. Films of the elbows of one of them show that the epiphyses of the radius and ulna are still ununited. (The radius should unite at puberty and the ulna in the sixteenth year.) Both elbows showed the same condition. The congenital dislocation of the radius which was present in this case permits a better view of the radius than is usual (Fig. 10).

They also tend to marry later than other males in their station. Once matured, a high proportion of them marry, and, if reproduction of the race is any test, it is evident that both

sexes are adequate. Furthermore neither castration nor any known form of infantilism produces such nail and hair changes as are here recorded.

THYROID

Some writers have suggested that the condition is basically a thyroid deficiency. Barrett diagnosed myxædema in some of his cases and proved it by biopsy. Ten per cent of our cases had an appearance suggesting hypothyroidism. However, it is to be remembered that these people and their ancestors have lived in a goitre district, and there seems quite as much thyroid affection in the normal inhabitants as in the affected group. While congenital hypothyroidism or cretinism is well known there has never been found any nail or hair condition to compare with this one. Indeed there is a case of true, and extremely marked, cretinism appearing on the chart as "a normal."

A comparison with our cases shows the following points.

	Cretin	This Dystrophy
When suspected.	Not for months.	At birth.
Dentition.	Delayed.	Mostly normal.
Teeth.	Poor.	May be good.
Skeleton.	Stunted (less than 4'7")	Some over average.
Epiphyses unite.	Late.	Late.
Nose.	Depressed bridge.	Some Roman.
Body.	Thick "pot belly".	Normal.
Legs.	Bowed.	Normal.
Sweating.	Never.	Normal.
Hair.	Coarse.	Very fine.
Eyebrows thinned	Outer third.	At least two-thirds.
Nails.	Thin brittle.	Short thick.
Skin.	Thick, white.	Thin, often pigmented.
Sexually.	Sterile.	Fertile.
Mammæ.	Poor.	Good.
Mentality.	Always dull.	Sometimes bright
Lips.	Thick.	Normal.
Metabolism.	Low.	Varied.
Pulse.	Slow.	Normal.
Hands.	Broad in youth.	Broad in age.
Life.	Usually short.	Often long.

The basal metabolic rate has only been taken twice. Jacobsen found a plus 23 on a child; but points out the unreliability of rates in children. In the only in which it was taken in our group, it was minus 14 in a man of 67. He was 5 feet 6 inches tall and weighed 222 pounds. Unfortunately he is the only male in

those inspected who showed obvious overweight. (It should not be forgotten that hypothyroidism is not the sole cause of a low basal rate.) A well marked case was in the Royal Victoria Hospital, Montreal, with a compound fracture of the tibia and fibula. A report on him says "At that time he did not show any signs of hypothyroidism." He left the hospital after six weeks and in a few months there was no discernable disability. There is no defect in the healing power.

Hypothyroidism undoubtedly is present at some stage in some of the cases, but it is not an essential part of the dystrophy and, as will be seen later, it would appear to be secondary to affections of other glands in the endocrine chain, rather than primary and causative.

SUPRARENAL GLANDS

Eisenstaedt noted a condition suggesting acanthosis nigricans. Such an appearance was present over the tuberosities of the ischium in one of my cases. Acanthosis nigricans is believed to be due to some disturbance of the chromaffin tissue of the abdominal sympathetics, which in turn is similar to that of the adrenal medulla. The pigmentations already noted on the knuckles, knees, elbows, axillæ, nipples and genitals, the exposed parts, etc., may to some extent be explained by the hyperkeratoid condition of the skin. However, in distribution they are suggestive of the earlier stages of Addison's disease.

Blood pressure readings were taken in 14 cases.

TABLE II.—BLOOD PRESSURE READINGS

Case No.	Sex	Age	Diastolic	Systolic	Dystrophy
10	M	16	60	92	Slight
30	M	16	60	110	Marked
29	M	25	60	110	Marked
33	F	30	75	122	Slight
(4 para)					
5	F	31	65	90	Severe
17	F	34	64	108	Severe
(7 para)					
24	M	36	65	95	Severe
24	M	36	70	106	Severe
1	M	43	90	118	Marked
11	F	45	65	108	Marked
(11 para)					
21	M	50	62	112	Severe
20	F	49	78	120	Severe
(6 para)					
35	M	84	70	130	Marked
6	M	87	80	180	Severe

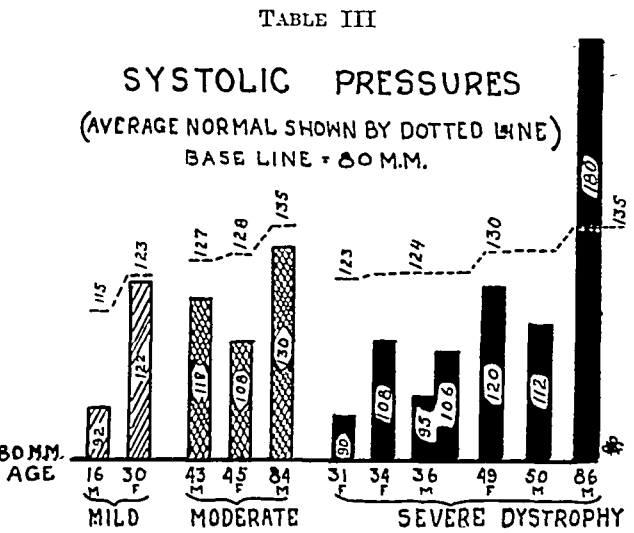
Case 10 is shown in Fig. 8. Pigmentation is a feature.

Case 5 died after years of periodic attacks of a condition in which there was great psychic and physical asthenia, and gastric and abdominal disturbances so severe that peritonitis was well simulated. There were very low blood pressures. Pigmentation was not more marked than in other cases.

Case 24 has had two attacks of abdominal distress associated with great muscular weakness and blood pressures of 70-106 and 65-95.

Case 21 has complained for many months of fatiguability and has a blood pressure of 62-112.

In Case 6, a man of 87, there is sufficient arteriosclerosis to show the vessels very distinctly in a skiagram of the hand. If we exclude this case it is seen (Table III) that no other pressure reaches the normal average systolic for the age, and that the lower pressures show a tendency to accompany the severer dystrophies.



As a whole these people sweat easily. Altogether, there is considerable evidence of suprarenal dysfunction.

It is interesting to note that the two structures most strikingly involved (*i.e.*, the hair and nails) differ in chemical composition from the rest of the skin chiefly in their greater content of sulphur. Swingle and Wenner,¹⁰ and also Loeper, Decourt and Garcin,¹¹ find the adrenals to be greatly concerned in the metabolism of sulphur. The medulla of the adrenal is derived from the ectoderm.

In the family groups which show a diminishing severity of the dystrophy there has been a coincident amelioration of living conditions.

In the group showing an increase in numbers and severity there has been an appalling degree of under-privilege. One man tells of a Canadian winter fifty years ago when their sole diet was cornmeal cooked in a frying-pan with candle grease as a lubricant. The profound effect which is produced on the adrenals by starvation or lack of vitamin B may be significant.

THE PITUITARY

If this dystrophy is ectodermal, and if there is any endocrine association, one might look for signs of involvement of the anterior lobe of the pituitary, which is derived directly from the ectoderm. We shall divide the signs and symptoms present in these cases into two main groups.

A. Symptoms usually attributed to decreased function.—(1) Late maturity. (2) Delayed union of epiphyses. (3) Thin smooth skin (in youth). (4) Scanty growth of hair of axillæ and beard. (5) Feminine distribution of the scant pubic hair. (6) Sexual hypoplasia. (7) Small sella tureica in all five cases examined.

B. Symptoms usually attributed to increased function.—(1) Two cases in which the bones of the hand are disproportionately long (increase before epiphyses united). (2) "Sausage fingers" or clubbed fingers (Figs. 2 and 8. (3) Accentuated normal lines of the skin (after middle life). (4) Kyphosis common in older men. (5) Thickened calvarium, heavy occipital protuberances and enlarged frontal sinuses, which were present in all the skulls x-rayed. (6) Marked tufting of the bones of the terminal phalanges. (7) Broadening of hands.

On this tufting great stress is laid by Cushing¹² and also by Bell¹³ as a sign of acromegaly. Towne¹⁴ says that "The characteristic changes" (of acromegaly) "are exostoses of the phalanges, which may be an early radiographic sign of the disease." Dock,¹⁵ in Osler and McCrae's *Modern Medicine*, says "The tufting of the terminal phalanges is a *unique and diagnostic sign* of acromegaly." Acromegaly is of course ascribed to dysfunction or hyperfunction of the anterior portion of the pituitary body. This tufting of the terminal phalanges was present in every x-ray which has been made of the hands of any adult male. (7 cases, see Fig. 11). However, as this tufting is often associated with some clubbing, two other suggested explanations may

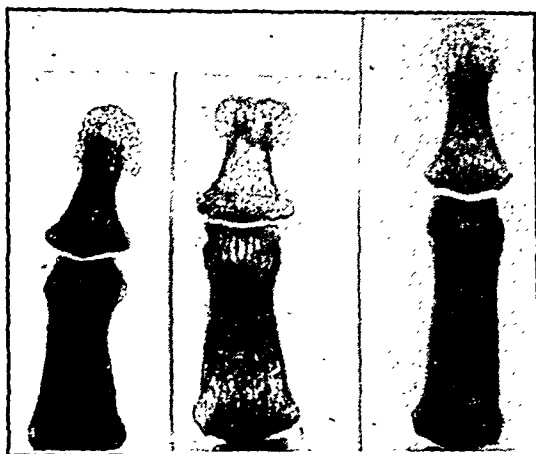


FIG. 11.—These are all from different cases. Note the tufting and the great length of the phalanges of the case on the right.

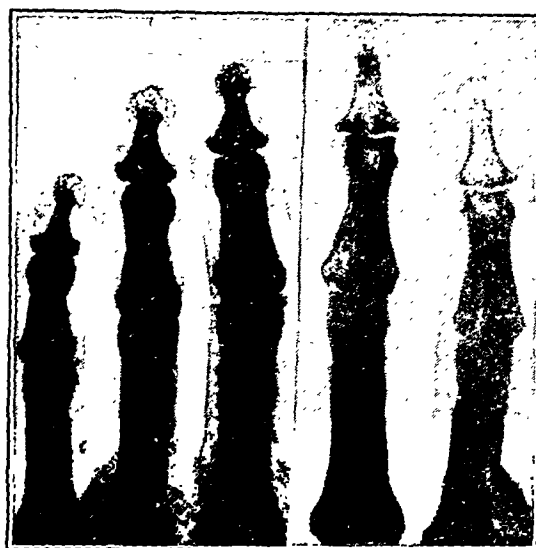


FIG. 12.—Two other cases showing a tufting of the terminal phalanges which is similar to that found in acromegaly.

be considered. It has been asked whether the clubbing and tufting are due to frequent subungual inflammation with its congestion, *etc.* This seems improbable because the tufting does not appear at the ages when the inflammation is frequent, but only later, when the inflammation has become largely a memory. Furthermore, the bony changes are not confined to the terminal phalanges.

Again it may be objected that the changes are those of secondary (or pulmonary) hypertrophic osteo-arthritis. Locke,¹⁶ whose authority on this subject seems to be accepted, concludes that hypertrophic pulmonary osteo-arthritis is always secondary, and that simple clubbing of the fingers and secondary hypertrophic osteo-arthro-

THE REGULATION OF THE BILE FLOW THROUGH THE BILE PASSAGES*

BY B. P. BABKIN, M.D., D.Sc., AND D. R. WEBSTER, M.D.,

*Department of Physiology, McGill University,**Montreal*

SINCE 1924 Dr. Béla Halpert¹ has advocated the view that bile having once entered the gall-bladder never leaves it through the cystic duct but is re-absorbed *in toto* by the gall-bladder mucosa. A new explanation of the formation of gall-stones based on this theory is advanced by him. About the same time, and independently, Sweet² expressed a similar idea. According to Halpert, the gall-bladder performs at least two main functions; first, the return of important constituents of the bile into the circulation; and second, the relief and regulation of the pressure within the biliary system by the re-absorption of bile while the sphincter of the ductus choledochus is closed.³

Halpert's theory is partly based on anatomical investigation of the structure of the gall-bladder and bile passages.⁴ He specially emphasizes the part played by the neck of the gall-bladder, the cystic duct, and the folds of Heister. "These structures," he said, "are the ones entrusted with the control of the passage of bile towards the gall-bladder. Their function is to regulate the inflow and to hinder or prevent outflow."

Halpert's conception is also partly based on experimental results obtained by studying the excretion of methylene blue by the biliary system of the rabbit.¹ It was found that methylene blue injected intravenously (2 c.c. of a 1 per cent solution per kilo weight) appeared in the hepatic bile in from three to fifteen minutes, and reached its highest concentration (1 to 1,000, to 1 to 3,300) before the end of the second hour. Then it dropped gradually and by the end of the sixth hour the concentration of the dye was only 1 to 9,000

and 1 to 36,000. The gall-bladder bile at the same time usually contained from twice to twenty-two times as much methylene blue as was contained in the last specimen of bile obtained from the ductus choledochus. Moreover, at times the concentration of methylene blue in the gall-bladder bile was much higher (1 to 720; 1 to 800) than the highest concentration ever reached in the bile collected from the ductus choledochus.

In another series of experiments methylene blue was fed to rabbits by the stomach tube. Bile collected from the cannulated common bile duct, twelve, eighteen, twenty-four, thirty and thirty-six hours after administration of the dye, contained little if any methylene blue. Methylene blue had practically disappeared from the hepatic bile and urine thirty hours after its administration. On the other hand, bile removed from the gall-bladder contained the dye, even after seventy-two hours, in most instances. In all the experiments the animals were anaesthetized with ether. A special quantitative method was elaborated by Halpert and Hanke for the determination of methylene blue in bile, after converting it from the leuco-form in which the dye is partly excreted into the usual blue form.

No doubt Halpert's theory would greatly simplify our conception of the functions of the gall-bladder and of the bile passages. In particular, it emphasizes one of the well-established functions of the mucous membrane of the gall-bladder, *i.e.*, its reabsorptive power, which, however, has never been denied (*cf.* Babkin⁵). But can the activity of the gall-bladder be restricted only to this function and to the well known property of regulation of pressure in the bile passages (*cf.* Mann⁶)? We are convinced that there are many well established facts which contradict Halpert's theory of the total re-absorption of the bile in the gall-bladder. What are these facts? The first question to

* The data reported in this paper formed the basis of a discussion by one of us (B.P.B.) of Béla Halpert's paper, "The functions of the gall-bladder and some of their disturbances in the light of recent investigations," read at the meeting of the New York Pathological Society in the New York Academy of Medicine on May 2, 1929.

be raised is the following: Does the gall-bladder empty its contents regularly and completely into the duodenum, or only, as Halpert and Hauke say, "occasionally and in small quantities"? (In discussing this question there is no necessity to touch the problem of the contraction of the gall-bladder, *i.e.*, of the mechanism of the emptying of the viscus.) The answer to this question is positive. The gall bladder, normally, every day, probably several times during the day, delivers its content into the duodenum.

In dogs with a permanent Pavlov's fistula of the common bile duct, a dark viscid bile is discharged during the first one to two hours after a meal, in some cases containing almost double the amount of solids to be found in the bile in the following hours. (Babkin⁷). The discharge of a thick dark bile soon after the introduction of different substances into the duodenum through the duodenal fistula, or after a meal, has been observed by many investigators (Rost,⁸ Klee and Klüpfel,⁹ London¹⁰ McMaster and Elman¹¹). After extirpation of the gall-bladder, bile collected from the ductus choledochus after a meal, or after the injection into the duodenum of a 25 per cent solution of magnesium sulphate was always light yellow in colour (Winkelstein and Aschner¹²). The conclusion to be drawn from these experiments is that the thick dark bile is delivered by the gall-bladder.

The second argument against Halpert's theory is that the gall-bladder empties itself completely after a meal, especially after a meal consisting of egg-yolk and cream. Evidences of this fact are too numerous to quote here (see the review of this problem in Babkin's book "Die äussere Sekretion der Verdauungsdrüsen," 2nd ed., 1928, pp. 740-758).

The emptying of the gall-bladder after a meal rich in fat was observed in fish, amphibia, birds and mammals (Higgins and Mann¹³). In our laboratory in cats and dogs we have seen the gall-bladder completely emptied after a meal rich in fat. One of us (Babkin¹⁴) and Miss Mackay* have seen complete emptying of the gall-bladder after a meal in several species of fishes (fundulus, eelpout, skate, flounder, sculpin, etc.). The gall-bladder bile in different

fish of the same species had a different colour, indicating the different time of stagnation of the hepatic bile in the gall-bladder (Mackay¹⁵).

Dr. E. C. Brooks, of the X-ray Department Royal Victoria Hospital, Montreal, has kindly informed us that in patients under his observation a normal gall-bladder, made opaque by intravenous injection of tetraiodophenolphthalein, emptied completely (the shadow disappears) two hours after a meal of egg-yolk and cream. In some cases on the following day Dr. Brooks could see the opaque matter present in the colon in the region of the hepatic flexure.

The only explanation which can be given to all these facts is that the bile is expelled from the gall-bladder and passes into the duodenum. It is highly improbable that certain stimuli increase the absorption of bile in the gall-bladder to such an extent that in the short period of one and a half to two hours no more bile remains in the gall-bladder. And what of the mucin which is secreted by the mucous membrane of the gall-bladder? Being a native gluco-protein, it cannot be absorbed as such by the epithelium, and there is no corresponding enzyme in the bile to digest it, since the gall-bladder bile always contains mucin and the more concentrated the bile is the more mucin there is.

Then comes the problem of the function of the bile passages. Halpert looks on them chiefly from an anatomical point of view. According to him, the function of the cystic duct, valves of Heister, etc., is to regulate the inflow of bile into the gall-bladder and to hinder or prevent its outflow. We have, however, precise data which show that the bile passages are not merely passive tubes through which the bile flows, but that they assist in the distribution of hepatic bile, directing its flow towards the intestine or towards the gall-bladder, or in both directions. This possibility is indicated by the presence of two sphincters, one the well known Oddi's sphincter at the duodenal orifice of the ductus choledochus, and another, which is located somewhere in the neck of the gall-bladder or in the cystic duct.

In a dog with a permanent fistula of the ductus choledochus (after Pavlov) and of the gall-bladder, it may be observed that during the first four to five hours following a meal of milk or meat hepatic bile flows from the com-

*Personal communication.

11 a.m.—We injected 4.5 c.c. of 1 per cent methylene blue solution into the ear vein.

From 12 noon till 3 p.m. food was given (dry oat chaff and water).

4.30 p.m.—We injected into the stomach by means of a stomach tube 60 c.c. of a mixture of cream and one egg-yolk.

6 p.m.—The animal was killed with ether and chloroform. The lacteal vessels were not affected. The gall-bladder contained 0.3 c.c. of light green bile. The duodenum and small intestine contained a small amount of chyme, yellowish and greenish-white in colour.

We did not try to restore with hydrogen peroxide and lead acetate the methylene-blue colour in the intestinal contents of the rabbits, since at this period of the work we were not taking into account the reducing properties of the hepatic bile.

DISCUSSION

The experiments on cats and dogs show clearly that after a meal of egg-yolk and cream the gall-bladder bile containing methylene blue is discharged into the duodenum. With regard to the experiments on rabbits, we can only say that the gall-bladder in both the animals operated on was practically empty. Special experiments must be performed to prove, as we have done for cats and dogs, that the gall-bladder bile in the rabbit regularly enters the duodenum. Although the digestive system of the rabbit differs greatly from that of carnivorous animals and man, it is doubtful that the function of the gall-bladder in the rabbit is entirely different from that of the

analogous organ in other animals. For example, Higgins and Mann¹³ have shown that in the guinea-pig, also a herbivorous animal, the gall-bladder empties after a meal rich in fat.

CONCLUSION

In cats and dogs the gall-bladder bile after a meal, especially after a meal containing fat, is regularly discharged into the duodenum.

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REPLACEMENT OF THE THUMB NAIL.—J. Eastman Sheehan, reports the case of a boy, aged 16 years, who suffered the loss of the nail from the left thumb. At the time he was examined, there was no longer any nail growth; at about the level of the lunula there was a disintegrating mass, while toward the point of the thumb the nail bed had given place to cicatrized tissues, warped and folded in leaves. There was considerable pain. It was evident, especially in view of the failure of previous interventions, that the problem was one of replacement—of introducing a nail that would grow. From this consideration two questions arose: Could nail substance transferred to an area in which growth had ceased be expected to grow? If so, from what area should it be taken, and what would be the subsequent history in the area to be denuded? On reflection as to the nature of the nail substance and as to the process of its production, it was recognized as being as truly epithelial as the epidermis itself, and no one who has had experience with reconstructive surgery can fail to have been made

aware of the complete dependability of the epidermal graft. The nail of the thumb of the other hand, to which the new one would be expected to conform, must be the donor, rather than the nail of the great toe, the only other practicable resource. The replacement of one thumb nail by a graft from the other thumb seemed therefore to be beyond prospect of misadventure, and the procedure was carried out in that belief, which was completely justified by the result. There was nevertheless a moment of dramatic interest when, on removal of the bandages, inspection disclosed that healthy growth was proceeding on both nails. Thus there was once more triumphantly vindicated the dependability of grafts whose dependence is on the nourishment of living epithelial cells by the lymph fluid present in the tissues of the base, the exceptional feature in this case being the relatively exaggerated thickness of the nail substance as compared with the horny layer of the skin epidermis.—*J. Am. M. Ass.* 92: 1253, April 13, 1929.

THE EFFECT ON DIGESTION AND ASSIMILATION OF INCLUDING
BANANAS IN THE MIXED DIET OF SOME CHILDREN
OVER FIVE YEARS OF AGE*

BY ALAN BROWN, M.B., AND ANGELIA M. COURTNEY, B.A.,

Toronto

THE nutritive value of the banana as a part of the diet of children of all ages is now widely recognized. Yet there are still many who hesitate to use it as a practicable carbohydrate component of the diet, especially in feeding infants. It may accordingly be in order, before beginning an account of the work reported in this paper, to enumerate some of the more important experimental studies bearing on the use of this fruit in the dietary of children.

Meyers and Rose¹ with adults and children, and Pease and Rose² with children only, made a study of the effect of abundant use of the banana in the diet, particularly considering the utilization of carbohydrate, and found entirely satisfactory results, provided that the bananas when used were fully ripe.

H. F. Day^{3, 4} reports excellent gains in weight in summer classes of under-nourished children when bananas, milk, whole wheat bread, and butter formed the important items of the diet. Sugiura and Benedict^{5, 6} in some studies with albino rats concluded that bananas and milk in proper proportions constitute a complete food, although they found bananas alone too low in their content of protein and vitamin B to provide for maintenance and growth of the rat. Thursfield,⁷ Johnston,⁸ Meysenburg⁹ each reports good results in some careful observations on a number of infants who were given ripe banana pulp as added carbohydrate to their milk feedings. Pritchard¹⁰ used successfully Jamaica banana flour as a gruel combined with milk, obtaining good gains in weight with several infants. The thorough and systematic study of Seriver and Ross¹¹ should be sufficient to convince the most cautious that ripe bananas can be used with safety as a carbohydrate substitute in the food of infants of all ages.

It has been shown also that the banana has a particular value in the dietetic treatment of nephritis with nitrogen retention, in the prevention of scurvy, and in celiac disease. Chace and Rose¹² report its use in nephritis. Givens, McClugage and Van Horne¹³ and Eddy and Kellogg¹⁴ have made studies showing that it is of value as a protection against scurvy. Eddy and Kellogg also found the banana a good source of vitamin A as well as of some value in providing vitamin B. Its peculiar value as a source of vitamin C lies in the fact that it can be taken in much larger quantities than the more potent antiscorbutics, lemon, orange, and tomato juice, and is at the same time a good carbohydrate food.

The value of the banana in the dietetic treatment of celiac disease, or chronic intestinal indigestion, is attested by all who have used it. There is general agreement that it is the best tolerated form of carbohydrate in this condition. Haas¹⁵ and Irish¹⁶ report cases showing beneficial effects from its use.

The study here reported is one on the effect on digestion and assimilation when a significant proportion of bananas is included in the mixed diet of children of five to thirteen years of age. The criteria used for judging digestion and assimilation were the retention of fat, nitrogen, and various salts in relation to the intake and the amount and character of the faecal output. Material for the study was obtained at an institution into which children, undernourished but not ill, are received for varying periods according to their need and given good food, fresh air and regular care. At the time when used for these observations the children had been resident long enough to show the typical rising weight curve following admission. They had good appetites and their haemoglobin was in no case below 90 per cent.

The plan was to use children in groups according to age, and, as far as practicable, to

* From the laboratories of the Sub-Department of Pædiatrics of the University of Toronto and of the Hospital for Sick Children, Toronto.

TABLE III.

Group	Diet	Percentage of Intake Retained							Urine Daily Average	Fæces Daily Average		
		Fat	Nitro- gen	Total Ash	CaO	MgO	P ₂ O ₅	Cl	Volume in c.c.	Moist wt. in grams	Total solids in grams	Solids: percentage of moist wt.
Lloyd and Mary 11 & 13 yrs.	With 3 bananas Control	94.1	18.8	3.3	16.9	27.1	21.8	7.8	1451	119.4	27.3	22.9
		93.4	20.5	13.3	21.9	27.8	21.5	22.5	1402	132.9	27.4	20.6
Lloyd and Mary 11 & 13 yrs.	With 6 bananas Control*	94.3	9.0	1.4	20.6	31.8	20.5	9.2	1340	134.6	28.2	21.0
		94.6	21.6	7.9	22.2	25.1	20.6	16.2	1403	93.2	22.2	23.8
Jack and Gordon 8 years	With 3 bananas Control	93.5	8.4	14.5	21.6	29.6	39.1	24.6	1081	151.0	25.8	17.1
		95.2	11.7	4.2	28.7	21.6	20.4	7.1	1133	123.0	17.8	14.5
Jack and Gordon 8 years	With 5 bananas Control	94.4	15.6	-0.1	12.1	14.3	11.6	1.4	1109	175.8	30.5	17.3
		94.3	17.4	-0.8	19.1	2.8	19.3	1.3	1202	145.1	25.1	17.3

*Lloyd's control lost.

on the chest, at the same time having a small rise of temperature and a mildly sore throat. All these symptoms cleared up in two or three days. Some weeks later she was again given six bananas a day for a week, but no symptoms whatever developed.

As regards gross digestion, the banana, in the ripe condition as given in this study, was far better digested than some of the vegetables of the diet were during both the control and the

banana-feeding periods. It was the rule to find easily apparent fragments of carrots or of beets in the fæces following the intake of those vegetables, but no banana was ever seen except slight traces in the case of three of the five and six year old children.

It is seen from Table I that the intake ran slightly higher in the control than in the banana periods in fat and nitrogen, due probably to a slightly greater milk intake in the desserts for which banana was partly substituted. Possibly a little more butter also was included in the control diets, as occasionally some bread and butter had to be omitted from the banana diets to make up the carbohydrate equivalent of the bananas. There was always a higher magnesium intake with the banana-containing diets, probably because of the relatively high magnesium content of bananas. The reported mineral analyses of bananas give especially high content of magnesium, potassium and chloride. Sherman,¹⁷ in a table of values compiled from various sources, gives 0.028 grams of magnesium (equivalent to 0.046 of magnesium oxide) in 100 grams of the edible portion of banana, considerably more than the amount in 100 c.c. of cow's milk. It might be mentioned here, incidentally, that, according to Sherman's figures, a good sized banana contains about five times as much iron as a glass of milk.

Considering the second half of Table I, it is seen that, judging digestion and assimilation from the per cent of the intake retained, there

TABLE IV.

HYDROGEN-ION CONCENTRATION OF URINE

Name	Age Group	Number of Bananas	pH of Urine	
			With Bananas	Control
Lloyd Bobbie G. Mary Jennie	10 to 13 years	3 a day	6.5 6.1 6.4 6.4	6.1 5.9 5.9 6.1
Lloyd Billy B. Mary Irene	11 to 13 years	6 a day	7.1 6.7 6.75 6.95	6.4 6.4 6.0 6.5
Gordon W. Jack Billy Br. Bobby R.	8 and 9 years	3 a day	6.5 6.8 6.7 6.85	6.4 6.5 5.6 6.3
Gordon W. Jack Bobby B. Betty	7 and 8 years	5 a day	6.85 7.3 7.05 6.95	6.3 6.4 6.45 6.1
Ethel Teddy Gordon B.	5 and 6 years	3 a day	6.85 7.25 7.4	6.6 6.9 6.8
Average of all			6.8	6.3

is not much to choose between the banana-containing and the control diets, particularly as regards fat, calcium, magnesium, phosphorus and chloride. In respect to nitrogen and total salts the separate groups show somewhat greater retention in the control than in the banana-feeding periods. With fat there is no real difference; with calcium and chloride the greater retention is more often in the control periods; with magnesium and phosphorus, more often in the banana-feeding periods. Except in regard to nitrogen the differences are indecisive and insignificant. The average of the findings for the individual children, regardless of age or number of bananas taken, confirms this general estimate of the difference between the retentions in banana and in control periods. Table III shows that Lloyd and Mary had a considerably reduced nitrogen retention on the greater banana intake but not in the corresponding control period. On the other hand, Jack and Gordon showed less disadvantage in nitrogen retention, as compared with the corresponding control, when taking five bananas than when taking three. The small disadvantage generally shown in nitrogen retention in the banana feeding periods is not necessarily to be taken as conclusive. The variation between individuals, even those of a pair on the same diet, whether banana or control, was often considerable and a larger number than eighteen and twenty observations would be necessary to determine whether or not there is anything actually significant in this finding. The retentions of fat and of the separate salt components were excellent in both banana feeding and control periods. The retention values for nitrogen and total salts are lower than was to be expected on both kinds of diets, considering the weight gains shown by the children.

In Table II it is seen that the volume of urine was always somewhat less in the banana-feeding than in the control periods; also that with all but one of the groups the moist and dried weight of the faeces was slightly greater with the banana-containing diets. The total solids in percentage of moist substance, as given in Table II indicate that there was little difference in the average consistency of the stools on the banana-containing and on the control diets. These values show that the faeces on the whole were of a firm consistency. There was with all the children variation from mushy to more or less hard formed

stools, never any diarrhoea on either diet. One child only, an eight year old girl, had always stools of the constipated type, of slightly moister consistency on the banana-containing than on the control diet.

In Table IV is given the average hydrogen-ion concentration of the urine for each child's four day period, determined colorimetrically in the twenty-four hours' collections. It is seen that the p^H in each case was distinctly higher with the banana-containing than with the corresponding control diet. The values from day to day for any child varied little, making the averages truly representative. That this lowered acidity in the urine is related to the banana intake is confirmed by the findings with four children who were observed in two periods, the second time with greater banana intake. Lloyd and Mary, with three bananas a day, had a urinary p^H value of 6.5 and 6.4 respectively; with six bananas a day a p^H of 7.1 and 6.75. Gordon and Jack, on three bananas daily, showed a p^H of 6.5 and 6.8 respectively; on five a day, 6.85 and 7.3. Lloyd's control period showed a slightly greater alkalinity in the second period, but not so great an increase as in the corresponding banana-feeding period, while with the three others the p^H in the second control period was lower than in the first, or unchanged. Thus, these findings indicate a definite effect of the intake of banana in decreasing urinary acidity. This observation may be of value in considering the modification of diets for children showing an acidic tendency. It may also help to explain the value of the banana in the diet in chronic intestinal indigestion.

SUMMARY

1. Children from five to thirteen years of age were studied in groups of four; two on mixed diet without bananas and two on the same diet with three to six bananas substituted for a corresponding quantity of carbohydrate. After a suitable interval the diets of the two pairs of a group were transposed.

2. Following a preliminary period on a measured food intake, representative samples of the food intake and the total urinary and faecal output of each child were collected for a four days' period. This material was analyzed for content of fat, nitrogen, total ash, calcium, magnesium, phosphorus and chloride. The moist and dried weight of the faeces and the

volume of the urine were noted daily; and the hydrogen-ion concentration was estimated in fresh urine and faeces. The percentage of intake retained was taken as the criterion of digestion and assimilation of the diets.

3. The average percentage of intake retained of the various components, for all the children observed, showed inconsiderable differences between the banana-feeding and the control periods. In respect to nitrogen retention the difference was somewhat greater than for the other components determined, but it is questionable whether this difference is great enough to be of any significance. The averages for the group periods showed small differences, sometimes to the advantage of the banana-containing diet, sometimes to that of the control diet, being more clearly to the advantage of the control diet in respect to nitrogen than any of the other components.

4. There was always a somewhat smaller daily volume of urine and somewhat greater output of faeces in the banana-feeding than in the control periods, but never any diarrhoea on the banana diet.

5. The urine was always distinctly more alkaline with the banana-containing than with

the control diets, as shown by pH values. This suggests that the banana may be of value for addition to diets in acidic conditions.

Thanks are due to the Board of Trustees and the Medical and Administrative Staffs of the I.O.D.E. Pre-ventorium, Toronto, for the co-operation which made this study possible; also to Miss Olga Moberly for her invaluable assistance as nurse in charge of the diets and collection of material for analysis.

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STUDIES IN THE PATHOLOGY OF DIGESTION

I. INTESTINAL FERMENTATION AND PUTREFACTION

BY JOSÉ M. ROSELL, M.D.,

Professor of Digestive Diseases, Barcelona, Spain

A GREAT number of intestinal disturbances, such as dyspepsia, diarrhoea, catarrh, and intoxications often follow one another in vicious circles and are caused by intestinal fermentation and putrefaction.

While much has been written and said about intestinal fermentation and putrefaction, not many positive chemical, bacteriological, or clinical facts have been presented, and the study of intestinal fermentation and putrefaction, their origin and nature, their clinical importance, their diagnostic demonstration, and their treatment, still deserve further investigation.

I have been occupied with the study of these problems for nearly twenty years, having com-

menced my investigations as an interne in Professor Senator's Royal Polyclinic Institute in Berlin. In course of time I have made more than two thousand coprological examinations in digestive diseases, and consequently have had opportunity to study many aspects of this subject. Investigations were carried on to determine the nature and extent of intestinal fermentation and putrefaction in the greatest variety of intestinal diseases possible, under the influence of various forms of diet, and the results of these studies were published in 1918.^{1,2} In this article I shall summarize the practical conclusions which I think may be drawn from these and other subsequent studies.

In one part of the systematic investigations

I have tested the quantity of the fermentative and putrefactive processes in various patients suffering from intestinal diseases, under the following different types of diet which I have administered from 3 to 8 days:

(1) Liquids only; tea, water, bouillon, as fast days; (2) Milk only; (3) Schmidt test meal for testing the general digestive powers; (4) Hydrocarbonated soft diet (rice, rye, tapioca, soup, mashed potatoes, etc.); (5) Vegetarian diet: (all kind of vegetables, beets, beans, potatoes, cabbage, salads, nuts, fruits, etc.); (6) Albuminous diet in soft form (eggs, chopped meat, gelatin, brain, soups of vegetable albumins, proteose, cheese); (7) Meat and fish diet in non-dietetic assorted kinds.

The analyses through which it was attempted to determine the effect of these various forms of diet upon intestinal fermentation and putrefaction and on other intestinal processes were the following:

A. Investigation of the general characteristics of the fæces, and also, in many patients, of the urine and the blood, especially of the albumin content of the blood through refractometrical methods.

B. The measurement of the fermentation and putrefaction process. For this purpose I have used the following chemical determinations:

1. Quantitative determination of acidity and alkalinity of the fæces by volumetric and colorimetric analysis.
2. Determination of the volatile, free, and combined fatty acids by extractive and distillation methods.
3. Determination of the free and combined ammonia.
4. Determination of the total nitrogen.
5. Schmidt's test of fermentations.
6. Tests of nucleo-proteids and dissolved albumins.
7. Bacteriological examinations.
8. Special urinalysis.

The technique for these investigations may be found in my books "Clinical Coprology" (Spanish or French edition)³ and my "Treatise on Diseases of the Pancreas."⁴

Where I found it necessary, I made an analysis of the gastric juice. In more recent times I have learned how fruitful the direct examination of the contents of the small intestine is by means of the intestinal tube of Einhorn (modified by Ganter), and especially that of Van der Reiss, who has perfected this method for the direct bacteriological and physio-pathological study of the contents of the small intestine. Our first results were sup-

ported for the most part by Roux and Goiffon,⁵ and Moxo.⁶

In the present paper will be given some of the conclusions of clinical importance which have been drawn from my investigations.

THE ACIDITY AND ALKALINITY OF THE FÆCES

The determination of the acidity and alkalinity of the fæces can only be made by volumetric titrations and colorimetric tests for acid and alkali; the extraction and distillation of free and compound acids and ammonias; and estimating the H-ion concentration by the electrometric method.

The test with litmus paper (the only one which has been used in coprology) does not give us clear information about the fermentation and putrefaction processes which have taken place in the intestine. Fæces which gives a neutral test when examined with litmus paper shows itself to be strongly acid or alkaline when examined by titration and delicate indicators. The volumetric analysis with indicators determines not only the acid- and alkali-ions in the condition of electrolytic dissociation (actual acid or alkali-ions), but also the potential ions from acids or their salts which have not much power of dissociation. There are many of these acids and salts in the composition of the fæces (acetic, formic, succinic, capronic, caprylic, valerianic, etc., and their weak salts).

The greater part of the stronger acids and alkalis in the intestinal contents appear in the fæces to be mutually neutralized as salts of ammonium, magnesium, potassium, sodium, and calcium. Only the determination of these combined acids and alkalis in the fæces can give us information concerning the fermentation and putrefaction processes. But a great deal of study is still necessary before one can determine exactly all the factors which are at work in the generation of acid and alkali and in the neutralization of the intestinal contents, and in their re-absorption. It is highly probable that the abnormal, pathological, grade of acidity and alkalinity of the fæces is caused especially by the volatile fatty acids and ammonia, in consequence of fermentative and putrefactive processes.

I have always found, as have other investigators, that in highly acid fæces there are many free volatile fatty acids, and this is almost

tion can increase to very large proportions. In view of these facts we can understand the large quantity of protein disintegration products which, especially in the presence of irritation, may arise from the intestinal wall and enter into the putrefactive process of albumins.

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THE USE OF MANGANESE CHLORIDE IN DEMENTIA PRÆCOX*

BY GEORGE E. REED, M.B.,

*Physician, Verdun Protestant Hospital,
Verdun, Que.*

WE at this clinic consider dementia præcox to be founded upon a congenital psychical defect, an early evidence of which is not inaptly described by a French School as "stranded on the rock of puberty." The physical basis of this disease is unknown. Hence, little faith can be placed in any drug which might conceivably be recommended as a cure. The work reported herein is based upon the general experience that the acute and progressive stages of dementia præcox are often relieved by treatment. Some clinicians have expressed the opinion that *any active treatment* is better than none; moreover, any means which aids in the immediate prevention or abortion of an acute episode is to be welcomed. Search for a rational therapeutics for the not uncommon abnormal physical characteristics of the disease led us, in the latter part of 1927, to the use of manganese chloride.

The earliest reference to this salt in the treatment of the psychosis was published by Reiter and Bisgaard¹ (1927) in Denmark, whose work was inspired by the experiments of Walbum.² The latter, at the State Serum Institute of Denmark, found that the simple salts of heavy metals, when injected intra-

venously in very small doses, would consistently prevent and cure specific diseases in experimental animals. Manganese was found to be one of the most useful metals in the case of staphylococcic, paratyphoid, and Shiga-Kruse infections, and in diphtheria and tetanus intoxications. This particular metal was of little use in tuberculosis. It is interesting to note that Walbum found that it did prevent tuberculin shock. He has proved that small doses of the metals have no stimulating action on the infecting organisms and that larger doses do stimulate the pathological process; it is a reasonable deduction then, that there is an optimum dose which is not to be exceeded. He has also shown that the more complex salts are inert. The mechanism is thought to be a catalysis of the biochemical defenses of the body. Considering the marked effect of salts on protein and colloid solutions this explanation is plausible.

Reiter and Bisgaard, of Denmark, and Schrijer, of Holland, each reported fifty cases of dementia præcox treated with manganese chloride with 50 per cent of the cases improved. Stenberg, in Sweden, obtained the same results, but rightly reserved drawing definite conclusions. These investigators were unanimous in recommending three precautions: first, to avoid treating cases with active organic disease;

* From a clinic at the Verdun Protestant Hospital, under the direction of Dr. C. A. Porteous, Medical Superintendent, whose help and advice the writer gratefully acknowledges.

second, to treat each case individually in regard to the dose of the drug; third, that all patients under treatment should have duly recorded the character and quality of the pulse, temperature, and respirations. The findings aid in determining the optimum dose. Our endeavour to verify the results of these workers began over a year ago, and we are now able to report on a small carefully worked out series.

A selection of thirty cases, representing as nearly as possible all types of dementia præcox was made (see Table I). These patients were put to bed under observation for two weeks; a physical examination, urinalysis,

blood count, and sedimentation test were made and a clinical record kept. The treatment was then begun and consisted in an intravenous injection of from two to eight c.c. of a 0.02 molar solution of manganese chloride. The European workers used a dose of from 0.2 to 2. c.c. of the solution. Thirty injections in all were thus given to every patient in the course of fifteen weeks. They were given 0.3 grams of manganese chloride by mouth twice a day for a month after the intravenous administration was stopped. When the drug was given by the mouth a tendency to produce catharsis was noted. We used an intravenous injection a

TABLE I

No.	Diagnosis	Age	Sex	Admission Record	Before Treatment Weight	Treatment Sed. Test	"R"	After Treatment Weight	Sed. Test	Result
1.	G.P.I.									
	History D.P.	40	Female	1926	111	—	—	106	—	No imp.
2.	D.P. Dement.	46	"	1912						
				2 former	80	—	—	106	0	Phys. imp.
3.	D.P. Dement.	24	"	1927	123	—	—	147	0	Discharged
4.	D.P. Manic	30	"	1927	102	—	—	108	—	Phys. imp.
5.	D.P. Paranoid	30	"	1927	102	—	—	101	—	No imp.
6.	D.P. Catatonic	19	"	1928	95	—	—	100	0	Phys. imp.
7.	D.P. "	44	"	1926	103	—	—	100	—	No imp.
8.	Melancholia præcox hist.	46	"	1925	142	—	—	153	0	Phys. imp.
9.	Depressed schizophren.	26	"	1925	111	—	—	118	—	" "
10.	Schiz. Moron	20	"	1927	90	—	—	97	—	" "
11.	Schiz. Simple	35	"	1927	110	—	—	127	0	" "
12.	" "	31	"	1928	80	—	—	81	—	No imp.
13.	" "	19	"	1927						
				2nd adm.	115	—	—	98	—	" "
14.	" "	45	"	1926						
				2nd adm.	91	—	—	98	—	Phys. imp.
15.	" "	34	"	1927	99	—	—	105	0	Discharged
16.	D.P. Hebe.	22	Male	5 former adm.	172	—	—	160	—	Discharged & returned
17.	" "	25	"	1926	160	0	—	160	0	Discharged
18.	" "	23	"	1927	123	0	—	135	0	" "
19.	D.P. Paranoid	30	"	1925	140	—	—	155	0	Phys. imp.
20.	D.P. Manic	20	"	1927	102	—	0	116	—	" "
21.	" "	34	"	3rd adm.						
				4 yrs.	131	—	—	140	—	Discharged
22.	" "	22	"	3rd adm.						
				3 yrs.	145	—	—	148	—	" "
23.	" "	44	"	Once be- fore 1927	143	—	—	150	0	" "
24.	D.P. Begin. Dementia	36	"	1928	125	—	—	129	0	Return and discharged
25.	Schiz. Simple	31	"	1927 & 2 yrs. ago	151	0	—	151	0	Phys. imp.
26.	" "	23	"	1927	138	—	—	144	0	No imp. Discharged returned
27.	" "	38	"	1927 & 15 yrs. ago	130	—	—	128	—	Discharged improved
28.	" "	21	"	1927	110	—	—	118	0	Discharged
29.	D.P.H.	28	"	1927	137	—	0	Nephritis		Recovery
30.	D.P. Catatonic	29	"	1927	130	—	—	Tuberculous pneumonia		Death

D.P.—Dementia Præcox

C.—Catatonic

H.—Hebephrenic

"R"—Reaction to Manganese

little larger than that recommended in the hope it would produce more rapid results. The amount was determined by the appearance of a slight reaction, noted by former investigators. This consists in a transitory erythema of the face and conjunctivæ associated with a feeling of warmth, but not accompanied by any change in the pupils, blood-pressure, or pulse rate. This "reaction" was obtained by a definite individual dose in all but two patients, who then received the maximum amount each time. Half of the group received a dose sufficient to cause a "flush" or "reaction"; the other half received 2 c.c. less than the amount in their particular cases which would cause the reactions. A sedimentation test was done during and after the treatment; this is of value in estimating the optimum dose. The clinical record was stopped at the end of the treatment. The cases were reviewed one year later.

We did not find any marked variation from the normal pulse or temperature, prior to or during the treatment, which could not be accounted for by some evident condition. We did find, however, that twenty-five of the thirty cases gave accelerated sedimentation tests, and that two of these were definitely pathological. No major organic disease could be found at that time. The physical condition of all of those under treatment prior to treatment was that familiar to psychiatrists, and we might summarize it as follows. Their average age was thirty years. Despite an adequate diet they were undernourished, even when active. A hypotonic neuromuscular system was evident in all but catatonic types. An impaired tissue turgor and unstable vasomotor mechanism was common. Edema and cyanosis of the lower extremities occurred frequently in the catatonic cases. The almost constant minor infections of the skin or mucous membranes, so frequently present, we interpret as a susceptibility to infection.

TABLE 2

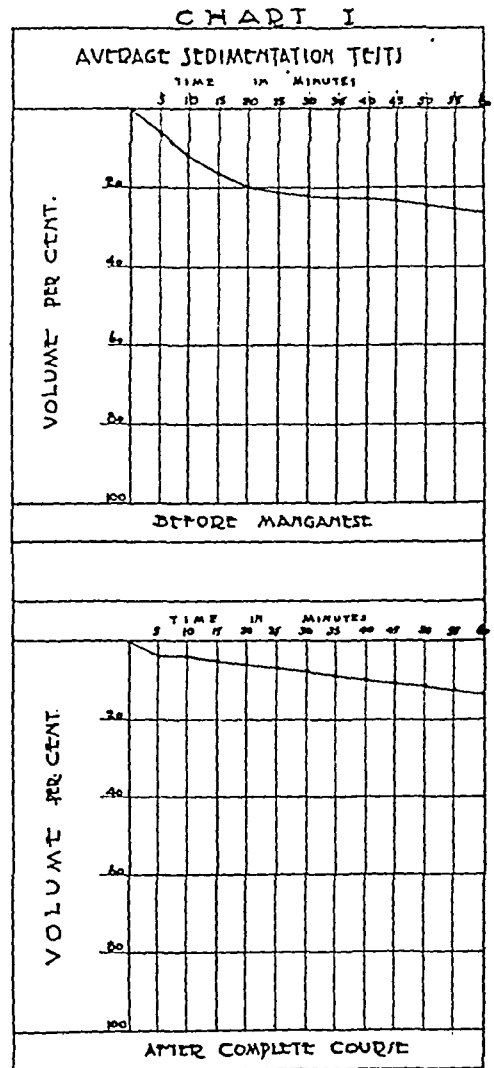
THIRTY CASES TREATED BY MANGANESE CHLORIDE

		Per Cent
"Reaction" to manganese	28	93
Rapid sed. test.	25	83
Improved sed. test.	15	50
Improved physically	17	56
Improved mentally	11	36.6
Definitely worse physically	2	6.6
Definitely worse mentally	1	3.3

100 untreated cases gave 18 per cent discharged improved in the same time.

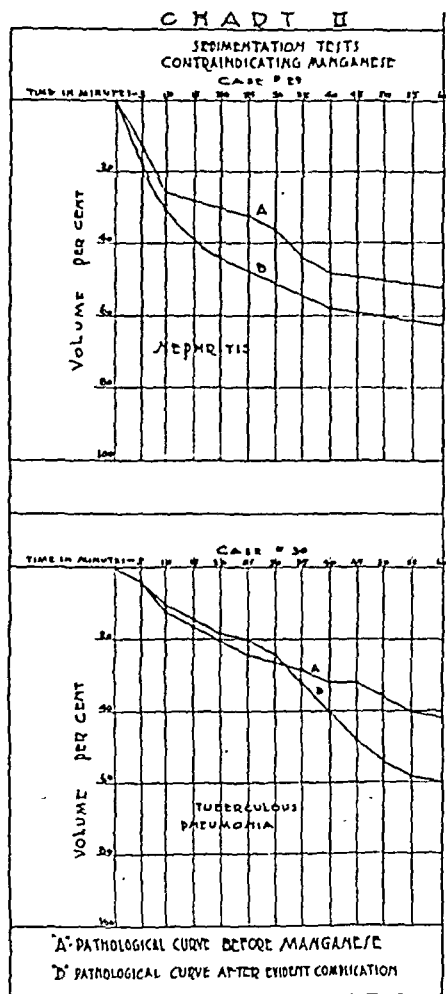
The results of the injections may be considered from many points of view, but certain facts stand out.

Considering the total number of cases we cannot duplicate the improvement percentage of the European investigators (see Table 2). However, we find that 85 per cent of our group gave an accelerated sedimentation test before



treatment. This improved in 50 per cent of cases as treatment progressed (see Chart I). Two were definitely worse physically following treatment, and these would have been excluded from the series had we then known the value of the sedimentation test (Chart II). It should be noted that all but three cases improved physically with the treatment, in that minor ailments and complaints disappeared. However, no case was recorded as improved physically unless there was a sustained gain of over five pounds in weight during treatment. No case was considered improved mentally unless

able to be discharged improved. These are, we think, very conservative criteria. It is interesting that one patient regarded as somewhat demented proved a rapid and so far stable cure: the catatonic types did not respond in any instance. Three of the eleven cases discharged returned to the hospital after some months, and after a short stay two have again gone home on trial.



We have compared the manganese treated cases with our cases in whom this therapeutic measure was not used. To avoid including chronic types we used the first one hundred admissions in 1928 with a diagnosis made by ourselves of dementia præcox. We find after one year that 18 per cent of the untreated have been discharged "improved," compared with the 36.6 per cent of cases discharged among those treated with manganese chloride.

Our clinical material should be divided into two groups of 15 men and 15 women (Table 3). A consideration of these, with the evi-

TABLE 3

Average age	30 years
Average age of discharged cases	27 years
Sex	male—15 cases; female—15 cases
Ages	6 over 30 years 11 over 30 years
	1 over 40 years 4 over 40 years
Average dose of mang.	4.5 c.c. 7 c.c.
No. discharged improved	9 2
No. improved physically	7 10

dent difference in sex, age, and dosage may help to explain (or confuse) the difference between the results. It is true that in receiving a smaller dose the male cases were treated more nearly as recommended by the original workers. It is also true that in this limited series of fifteen men we have verified the percentage of the European clinic, viz., about 50 per cent. A comparison of the two groups further demonstrates that an improvement in the physical condition does not always mean mental improvement. It is to be remembered that a gain in weight in patients presenting a præcox syndrome often accompanies the onset of psychical degeneration, even when not treated by this method.

CONCLUSIONS

1. Manganese chloride, as used above, may be expected to improve the physical condition of many patients with dementia præcox.

2. The salt is contra-indicated in larger doses than recommended, if given repeatedly. It will cause an exacerbation of physical symptoms if any major organic disease is demonstrable or even suspected. One of the essentials would appear to be that the optimum dose must not be exceeded. Hence with the present technique and dosage it should *not* be used in a routine manner.

3. The weight chart and the sedimentation tests have proved the most valuable indices of the general condition of the patient and for ascertaining the optimum dose. We have not been led to the belief that the temperature and pulse variations are of any special value in this regard, as is mentioned by Bisgaard.

4. We have observed a substantially higher discharge rate among the cases with manganese than in similar cases not receiving treatment. However, we feel that more work will be required, and is justified, to determine whether the results are real or apparent.

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THE CURABILITY OF DIABETES MELLITUS*

By J. A. GILCHRIST, B.A., M.B.,

Toronto

THE treatment of a diabetic patient is essentially conducted by a co-operative company of eight different units. The success or failure of the treatment depends upon the success or failure of each member of this company, and the dividends paid are in the health and well being of the patient, his ability once again to take his place as a useful working member of society, and his continuing influence upon an ever expanding circle of relatives, friends, and acquaintances. The partners in this company, as they appear, are as follows:—

1. The diabetic patient.
2. The diabetic consultant.
3. The hospital dietitian.
4. The hospital nurses and housemen.
5. The laboratory technicians.
6. The social service workers.
7. The patient's family and friends.
8. The patient's family medical adviser.

These eight independent units contract together, and are mutually inter-related, to transform an invalid, a non-worker, into a well working unit of society.

The more I see of diabetic work the more convinced I am that we can not only keep the diabetic patient alive, by diet, or diet and insulin, for a normal expectation of life, but that we can cure a large percentage of our cases, and by cure I mean a return to normal diet, normal blood sugars, and an aglycosuric state; but, to achieve this, we must have the constant co-operation and interest of all of the members of this diabetic co-operative company.

Dr. Joslin¹ in his paper on ten-year diabetics, points out that in the State of Massachusetts the expectation of life of the patient who has lived for ten years under the diabetic regime, is three years longer than that of the normal individual. These figures are startling, but none the less true, and, when analyzed, bear out the fact that when an individual with a handicap learns to take care of himself he usually lives longer than his more healthy but

careless neighbour. This was repeatedly demonstrated in the various influenza epidemics of recent years.

In our treatment of diabetics we are often so energetically concerned in treating the disease that we forget how unsuccessful any effort will be that fails to treat, first of all the patient, and secondly the patient's family, friends, and medical adviser, upon whom devolves the continuance of the treatment when the patient returns home. Two examples will illustrate what is meant.

One patient, of almost wealthy circumstances, who is now successfully progressing to health, deliberately stopped a former complicated diabetic regime because he could not keep a maid. The requirements of frying meats and eggs separately in mineral oil, and the necessity of altering butter and cream rations to compensate for various meats, fish and fowl, were so time-consuming and irksome that he was faced with the alternative of getting a second maid to handle his diet, or with giving up his treatment, and he chose the latter.

Another patient, a farmer, was referred with diabetic gangrene of one leg by his physician, who was sufficiently enlightened to appreciate that without a dietitian to control his diet it was impossible, in the local hospital, to successfully amputate the leg. The patient became sugar-free on diet and insulin, and a successful amputation was performed. During his convalescence, his wife came to Toronto, and soon was trained to handle his diabetic diet, and to administer insulin. On his return home, a report embodying his diet and insulin requirements was forwarded to the local medical practitioner, who had so wisely referred the case in the first place. Included in this report was a statement, that the circulation of the remaining foot was markedly impaired, and that any deviation by the patient from the path of normal blood sugars, would probably terminate in gangrene and loss of the remaining leg.

On viewing the diet list, with its bran muffins, the doctor informed the patient that these were not necessary, and that he could substitute any amount of bread, dried in the oven, in their place. A private communication from his wife advised that this had caused the return of a marked glycosuria, and the doctor was written to once, and the patient twice, warning them of what would happen. One year to the month, this patient returned with a diabetic gangrene of the other leg, which was successfully amputated, but he succumbed on the fifth day to an embolus dislodged from the site of operation.

Now let us consider for a moment the scientific side of the diet problem. The analysis of 29 samples of apples, as given by Atwater² in American Food Materials, shows a range

* Read at Christie Street Hospital, Department of Pensions and National Health, February 28, 1929.

from 8.8 to 21.3 per cent, and these are classed ordinarily as 15 per cent, a variation from the normal as low as 41 per cent and above as far as 44 per cent. Similarly, let us consider the protein of loin of lean beef. Here the twelve analyses show a variation of 32 per cent below and 22 per cent above the average analysis. If the individual articles of each meal could be analyzed separately, there would probably be found a working error of at least 25 per cent, but what is gained in one article of diet is lost on another, so that our average figures for a meal are probably nearly correct. From a practical standpoint the fact remains that if the patient weighs his food accurately he remains sugar free, and with blood sugars normal, despite the fact that he sails between the Scylla of glycosuria, on the one hand, and the Charybdis of hypoglycæmia on the other.

With these errors in our diets, why then should we vex ourselves and our patients with dietetic figure fractions? Why then should we not lump all the meats, fowl, fish, etc., under "meats," and not make the patient's life intolerable by insisting that when he switches from beef to lamb, and lamb to veal, he has to have different weights for each, and has to alter his butter or cream rations at each meal to compensate for the fats? And why should we insist on a separate frying of meats in vile-smelling mineral oil? Oftentimes our efforts at being scientific make the dietary régime so galling that many a patient has preferred to give up what has become an intolerable business, and pray that an unrestricted diet may soon put him out of his misery. In other words, we are so keen on treating a disease that we forget that we are treating a patient. Surely the criterion of the success of any treatment is to get the patient well, and keep him well and working. And, once again, the proof that it can be done is the fact that innumerable diabetic patients are progressing to cures, and, apart from intercurrent complications and infections, are staying sugar-free and keeping their blood sugars within normal range.

In discussing the various methods of treating diabetics, one may say "all roads lead to Rome" but some roads are more steep than others and travel needlessly over many barren hillsides, while some lie along the more pleasant verdure scattered valleys.

With regard to carbohydrate, it is better to give a patient 100 gm. of carbohydrate in his diet, if he will stick to it, than to give him a diet of 40 or 50 gm. to which he will not adhere.

Scientifically, two-thirds of a gram of protein per kilogram of body weight may be sufficient for the replacement of the body-tissue of a patient in hospital, but if he is to lead an active life, and have any joy in the living of it, he requires a gram of protein per kilogram of body weight.

With regard to fat, many a patient who has nothing wrong with his gall bladder, cannot tolerate more than 170 gm. of fat daily for 365 days in the year without getting nauseated, losing his appetite, and developing an oily skin, with acne eruptions. The argument in favour of fats is the low available carbohydrate content of 10 per cent. More recent work will probably show that much higher values than 10 per cent must be utilizable by the human metabolism. Furthermore, in a series³ of more than two hundred diabetic patients, it was discovered that 57 per cent of these had, as a complication and probable etiological factor for their diabetes, gall bladder disease, with or without gall stones. Why then should we give half of our diabetics indigestion and bilious attacks and produce vomiting and acidosis from high fat diets?

Dr. Joslin, of Boston, states that of his ten-year diabetics only 15 per cent are free from atheromatous changes associated with arteriosclerosis. This, he holds, is due to high fat feeding, the laying down of fat in the media of the vessel wall, and later, the formation of atheroma. I do not doubt his figures, for when I was in Boston, the happy guest of the New England Deaconess Hospital, he had trained assistants going over his histories in a very exacting and scientific survey. I doubt his interpretation, however, because at the date of his paper, insulin had only been with us for six years and generally available for only five, and his younger, and consequently more severe, diabetics, had died. The milder cases, those of more mature years, are those who were more likely to survive a ten-year period of observation, and are just the ones in whom one would naturally look for arteriosclerosis. With the passing of each year, I venture to predict that

and butter dish, and weighs out his whole day's ration of these articles at breakfast, and apportioned them approximately at each meal during the day.

In the Department of Pensions and National Health we are now using as bread substitutes, various muffins made from Tillson's unwashed bran, recipes for which may be procured by writing to Miss C. Hazlett at this hospital. One package of bran, costing twenty cents, constitutes approximately a month's supply, and avoids the high protein and high cost values of Lister's, diaprotein and Allenbury flours, and also the unsettled problem of the utilization of the carbohydrate of soya bean. These muffins are a palatable vehicle for butter, and from the patient's standpoint, much to be prized above Cellu or washed bran biscuit.

Our more intelligent patients, who can understand food value figures, are permitted to use more complicated desserts, but for the most part, the diet is carried out as it appears on these simplified diet forms.

Let us now go one step farther than the treatment of the disease, which is comparatively simple. If we are ever to cure the disease, we must know the cause. The etiological factors are varied, but easily discoverable if we but search diligently. More than one cause may be present in the same patient. Having diagnosed the cause, and having treated it, as well as the disease, can we be accused of being too optimistic for thinking that a large number of our cases can be cured, particularly those who come early and become sugar-free before permanent damage is done to the islet cells of Langerhans?

The etiological factors of diabetes mellitus are as follows: a hereditary defect of the pancreatic islet tissue; arterio-sclerosis; endocrine gland disturbance; dietary excesses and obesity; cranial injuries; focal infection.

There is undoubtedly a familial, as well as a conjugal incidence of diabetes. This may be due to a hereditary factor or defect, but probably is due to the similar mode of living and eating of various members of the same family. We all know of families who eat extraordinary amounts of carbohydrate, whose members are all overweight, and who exercise inadequately. This fact, combined with the facilities for contracting the same infections,

is the probable explanation of the majority of these familial cases of diabetes rather than a hereditary tendency. A large number of the patients who have been under the care of this Department since the discovery of insulin in 1922, now have families, and in no instance has it been discovered that the second generation has developed this disease. A defect of pancreatic islet tissue is a possibility, but a very rare and minor factor in the etiology of diabetes mellitus.

Arteriosclerosis is undoubtedly a large factor in the older diabetic, and here the disease is insidious in onset, but usually of mild degree and easily controlled by diet without the use of insulin. Associated with the arteriosclerosis is often some impairment of kidney function, and when this has been determined and corrected the patients can readily carry on with very little disability. This type, however, in view of the permanency of the atheromatous changes, is not as likely to give rise to a great percentage of cures, and carelessness on the patient's part with regard to diet usually terminates, not in diabetic coma, but in diabetic gangrene and infection. A word of warning about the elderly diabetic may not here be out of place. With kidney function impaired, the renal threshold for glucose is often quite elevated, and trusting to urinary samples which are sugar free, may lead one into a false sense of security. Blood sugars are most important in this type of case. Another warning to be heeded in elderly diabetics, is not to lower the blood sugar too far or too fast, or you may lose your patient with an anginal attack, probably due to the fact that his heart muscle receives an insufficient supply of glucose.

As our knowledge of the endocrine glands has grown we have learned of their inter-relationship. As safety valves upon insulin activity we have the secretions of the thyroid and suprarenal glands. Hence the necessity arises for the routine examination for the basal metabolic rate in all diabetic patients. By so doing, we eliminate the chance of overlooking a mild hyperthyroid condition. The severe hyperthyroid case with diabetes, while giving a sensational recovery from both diseases under surgical means, is an extremely worrying and dangerous patient, for thyroid storm and hypo-

glycæmia, associated with myocardial degeneration, can easily produce a fatal termination.

We are still hoping for an adequate and reliable test for adrenal function. Those available at present are dependent upon so many variable factors that their reliability is open to grave doubt. Undoubtedly, the suprarenal gland is a safety valve upon carbohydrate metabolism, as evidenced by the hyperglycæmic rise of the blood following the injection of adrenalin, and the pupillary dilation caused by the sympathetic stimulation in marked hypoglycæmia.

The pituitary gland also exercises a controlling hand upon sugar metabolism.⁴ In hypopituitarism there is increased sugar tolerance; in hyperpituitarism there is a decreased sugar tolerance with increased urinary output.

Dietary excesses, and consequent obesity, are often a precursor of diabetes mellitus. Between 1 and 2 per cent of the American population are afflicted with this disease, and this undoubtedly is due to the fact that the per capita consumption of sugar in the United States in pre-Volstead days was five times greater than that of Great Britain, and greater still since the passing of the Volstead Act. The incidence of diabetes among overweight people is immeasurably greater than among people who are of normal weight or under.

The greater use of motor cars, which provide fresh air and keen appetites, without the necessity of physical exercise, is also a big contributing cause for obesity, and later, either arteriosclerosis or diabetes, or both. One has only to gaze in awe and wonder at the prodigious meals consumed by our summer motorists to cease to wonder that only 1 or 2 per cent of them have a true glycosuria. This type of diabetes is usually mild, and, with proper weight reduction, and dietary supervision, the patient soon regains a normal carbohydrate tolerance.

Cranial injuries, with possible damage to the floor of the fourth ventricle, are another etiological cause of diabetes, but unless the injury is severe and the glycosuria untreated, persons so affected readily regain a normal tolerance for glucose.

Disease or injury of the pancreas may also produce a true glycosuria, but this is uncommon owing to the reserve of islet tissue of this

gland. Massive slough of the body of the pancreas, following hæmorrhagic pancreatitis, is rarely associated with glycosuria. Allen⁴ has demonstrated the fact on animals that no diabetes is produced with the removal of three-quarters of this gland, or even as much as seven-eighths.

One of the largest etiological factors in the production of diabetes is focal infection. This must be searched for in teeth, tonsils, accessory sinuses, genito-urinary tract, and digestive system. This is particularly true of the younger adult and children. English investigators, namely, Laurence,⁵ Buckley,⁶ Evans and Zeckwer,⁷ published in the last two years the results of their investigations on the effect of focal infections and toxæmias on carbohydrate metabolism. They found that these agents stimulated the thyroid and suprarenal glands, and their over-activity made diabetes worse and prevented the usual action of insulin. Control work on non-diabetic human beings brought out the fact that carbohydrate metabolism was also lowered by these same toxic and infective agents. Their work has given us a physiological explanation of the well known clinical fact that insulin, both endogenous and exogenous, is more or less inactive in the presence of infection. Furthermore, this effect is present in non-diabetic animals and human beings.

In a series of over 200 cases compiled from our Diabetic Clinic in this Department, private practice, and the Toronto Western Hospital, 57 per cent were found, on test by cholecystography, to have cholecystitis or cholelithiasis. This is considerably more than one would expect, for Dr. W. H. Dickson, of the Toronto General Hospital, has found only 33 per cent of diseased gall bladders in a series of 4000 cases referred for radiological examination because of some gastro-intestinal symptoms. Furthermore, about 10 per cent of these cases, with cholecystitis, had no history or clinical evidence of this focal infection. Hence the necessity for routine tests by cholecystography in all diabetic cases.

The proper treatment of the diabetic with a complication of biliary tract infection depends to a large extent upon progression or retrogression of his diabetic condition. The use of pepsin and bile salt tablets, which are avail-

able for use in this Department, has produced marked improvement in some cases, as evidenced by their increased carbohydrate tolerance and improvement in their cholecystographic picture. In spite of the pepsin and bile salt treatment, other cases show decreasing tolerance, and these, I feel, would be better with cholecystectomy, followed by a prolonged course of bile salt treatment to eradicate the residual biliary tract infection.

The following two case reports will serve to demonstrate what can be done by treating the etiological factor as well as the disease.

CASE 1

Case 1 came under observation in January, 1927, with a history of polyuria, polydipsia and polyphagia, of two months' duration, and a loss of twelve pounds during that period of time. His age was sixty years, height seventy-one inches, weight 254 pounds. His normal weight was 175 pounds. The twenty-four hour urinalysis was as follows: volume 3,240 cubic centimetres; acetone 3 plus; albumin negative; sugar 8.5 per cent, (275 gm.). He gave a history of being jaundiced as a child. Blood pressure was 185 systolic, 110 diastolic. He became aglycosuric on a diet of carbohydrate 68, protein 84, fats 150, without the use of insulin. The etiological factors in this case were obesity, chronic cholecystitis (confirmed by radiological methods), and slight arteriosclerosis with hypertension. In just two years' time, using only diet and papain and bile salt tablets, and with careful co-operation of the patient with regard to weighing of his food, the patient is now handling a diet of carbohydrate 240, protein, 92, fats 150, and is constantly aglycosuric and with normal blood sugars. His weight has been reduced to 215 pounds, and his blood pressure to 140 mm. systolic, and 80 mm. diastolic. This patient is now doing twice as much work as formerly, as executive head of one of our large business concerns.

CASE 2

Case 2 was a lad of sixteen years, who was admitted to the public wards of the Toronto Western Hospital in September, 1927, for tonsillectomy. It was found that he had a glycosuria of the true diabetic type, and he became sugar free and with normal blood sugars on a diet of carbohydrate 125, protein 60, fats 125, without the necessity of insulin. Tonsillectomy and submucous resection were performed, and during his uneventful convalescence, it was discovered by intravenous iodekon cholecystography that he had as a second infective etiological factor, chronic cholecystitis.

He, too, has been a most co-operative patient, and with the use of papain and bile-salt tablets, and the eradication of his upper respiratory tract infection, has, in one year and a half, returned to a diet of carbohydrate 240, protein 70, fats 120. A re-check of his gall bladder, using iodekon orally, has shown a greater concentration of this salt than on the previous examination, although the radiographic picture is not yet quite up to normal.

These case histories are but typical of the progress that nearly all co-operative diabetics are making when the etiological factor of their diabetes mellitus is treated, as well as the disease. If we bear in mind the physiological reserve of 75 per cent of this gland, and the microscopic as well as clinical evidence of regeneration of the pancreas, can we be accused of being too optimistic when we hope that we are on the threshold of an era when we can cure a large percentage of our patients suffering from this disease?

Furthermore, in our non-diabetic patients, if we diagnose early and treat their arteriosclerosis, correct the mal-functioning of the ductless glands, particularly hyperthyroidism, eliminate obesity and over-eating, ease the mental strain of the over-ambitious, and eradicate all focal infection, then surely we can also hope to prevent the onset of diabetes, and instead of a steadily increasing incidence of this disease, we shall find a progressive diminution.

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THOSE WHO ATTEND CONFINEMENTS.—Midwives chiefly attend people who are unable to afford to engage a doctor as well, and I can think of no one more suitable to attend a normal confinement than a fully qualified competent midwife. In quite a large number of cases she is actually on the spot before the patient has started labour. Once labour has started she is able to give up the whole of her time to her patient until the labour is finished, and she is in constant attendance on her

patient for the first ten days of the puerperium. To prevent her doing more than to "wait and see" she is only allowed to take with her to a confinement an appliance for giving a vaginal douche, an appliance for giving an enema, a pair of scissors, a clinical thermometer, and a nailbrush; and the moment she finds herself in any difficulty she is expected—nay, even compelled—to send for medical assistance.—*Brit. M. J.*, May 11, 1929.

SPONTANEOUS PNEUMOTHORAX*

BY ARTHUR A. ROWAN, M.D.,

Ste. Anne de Bellevue, Que.

IT will be the attempt of this article to consider the phenomenon of spontaneous pneumothorax with particular regard to the symptomatology, and to deal also to some extent with the treatment and immediate results.

In approaching the subject by reviewing the literature on pneumothorax, both artificial and accidental, one is forcibly reminded of the words of the Preacher in Ecclesiastes: "Of the making of many books there is no end, and much study is a weariness of the flesh." Although this statement is incontrovertible, and although it is becoming more and more true from day to day, nevertheless the writer will attempt to put before you certain points pertaining to the subject of spontaneous pneumothorax which if mentioned in the literature are certainly not stressed.

There are two kinds of pneumothorax, the *artificial*, of which there is frequent mention in the literature; and the *accidental* or *spontaneous* which is spoken of very little. We may divide spontaneous pneumothorax into three varieties: that occurring with demonstrable tuberculosis, where artificial pneumothorax does not enter into it; that occurring with or complicating artificial pneumothorax; and the spontaneous collapse of the lung in which there is no evidence of tuberculosis.

That we may come as quickly as possible to the pith of the matter, a typical case of each variety will be first presented, with a summary of the symptoms, after which, in order, the type itself will be discussed in a few words.

CASE 1

A large spontaneous pneumothorax occurring in a case of far advanced tuberculosis with cavity formation.

Mrs. Clara B., aged 27, had been weak and poorly since the influenza epidemic of 1918, and, from her

symptoms, definitely tuberculous for three years previous to this accident. At that time the left lung contained a moderate amount of disease only, but the right already harboured three cavities, the largest of which, near the apex, occupied a quarter of the available space on that side. In addition the patient had a tuberculous laryngitis. Her temperature was usually 100 degrees in the afternoon and the pulse rate was about 85. She was confined strictly to bed.

On December 6, 1927, she complained of a pain in the right shoulder, and later of quite severe pain on the same side of the thorax. At 3 p.m. the temperature was 103.5 degrees and the pulse 130. A mustard plaster gave but little relief.

The next day the temperature reached 104.8 degrees and the pulse 145. The cough became very troublesome and suggested pleural irritation. Examination revealed no change and the chest was strapped with adhesive plaster. Through the night, shortness of breath became very marked and the patient did not sleep. In the morning (December 8th) it was found that over the right side the breath sounds were practically absent and that the heart was displaced to the left. The patient complained of a great shortness of breath, of a choking sensation in the throat below the larynx, and of difficulty in swallowing. She was very tired from persistent coughing and lack of sleep, and she was sweating profusely. The facies betokened exhaustion and extreme anxiety. The temperature had now reached 104 degrees and the pulse 140. We put a needle in the chest and found a pressure of plus 20 plus 40 m.m. of water. (These and further readings are from one limb of the Robinson manometer only, and have not been doubled). After taking off 700 c.c. of air with marked relief of the dyspnoea the readings were minus 20 minus 40. Although codein, heroin, and a quarter-grain of morphine had all been tried we were unable to quiet the cough or to procure more than a few minutes' sleep.

December 9th found the patient's breathing as embarrassed as before, with the addition of some odd sensations at the back of the mouth, where we saw on inspection that the left pillar and arch of the palate was drawn upward and laterally. Recourse to the needle gave pressures of plus 30 plus 60. We withdrew 700 c.c. of air, and the pressure was left at minus 10 minus 30. The temperature was 99.8 to 102.5 degrees, and the pulse 110 to 120, whilst the sputum had decreased from four to two and one-half ounces.

On the morning of December 10th, with thoracentesis, a thin, sticky, yellow fluid made its appearance, of which we withdrew 280 c.c. and later in the day 600 c.c. of air; pressures being plus 25 plus 35 and minus 25 minus 5. Chloral hydrate, 15 grains, repeated once, gave some little rest at night. Another 900 c.c. of air were withdrawn on December 13th, in two punctures, both made above the fluid level.

On December 17th, 330 c.c. of air and 125 c.c. of fluid were removed, with poor readings due to the occlusion of the needle by fluid.

After December 19th the temperature went no further than 101 degrees, and the pulse did not exceed 120. The dyspnoea had decreased a good deal and the cough became less, so that the patient obtained some sleep. It is this dyspnoea, or rather the CO₂ content of the blood resulting from it, which makes sleep impossible and so

* This paper is based upon cases studied at the Jordan Memorial Sanatorium, Riverglade, N.B.

long as there is a great shortness of breath insomnia persists.

The acute symptoms now subsided and two months later we found the patient as follows. Cough and sputum were again slightly increased; there was pain on both sides of the chest and also in the upper abdomen; all to a large extent due to pressure, for we had not removed the fluid since December 17th (written in February, 1928). The appetite was slightly better and sweats were less bothersome.

The physical signs and symptoms of this patient may be thus summarized. Pain in the shoulder; pain in the chest (severe); dyspnoea, increasing gradually; temperature, elevated to 104.5 degrees; pulse, elevated to 140; cough, very troublesome and later decreased; sputum, decreased from 4 to 2½ ounces; sweating, profuse; anxiety, acute; insomnia; dysphagia; paralysis of a nerve, with result seen in fauces; choking sensation; pain in the opposite side of the chest, along the line of the mediastinum; rapid onset of fluid; ball or flap valve fistula.

With the review of Mrs. B.'s characteristic history we shall also discuss the findings associated with a large spontaneous pneumothorax of this, our first, type.

There is no means of definitely gauging the frequency with which large spontaneous pneumothoraces occur. E. W. Hayes¹ quotes Morris as saying that spontaneous pneumothorax occurs in 1 to 13 per cent of tuberculous cases as a whole, whilst Matson and Bisailon² believe that 1 to 3 per cent of artificial pneumothoraces develop a spontaneous form. Thus we believe that our *bête-noir* will make its appearance in 1 to 10 per cent of plain tuberculous cases, and the larger varieties, being more frequently diagnosed, must be nearer one than three per hundred.

In our patient we found the pain in the chest situated, as is usually the case, on the lateral aspect of the thorax and not localized to one spot. It was severe, indeed, but not so intense as the pain of renal or ureteric calculus. Her pain was sharp, and sometimes of a tearing character. It was associated with pain or distress in the same shoulder and did not last in its initial severity throughout the attack.

The dyspnoea was not sudden but gradual, and was fairly rapid, which is not atypical. The ball-valve nature of the fistula made it the outstanding symptom, for she soon proceeded to smother herself with air. Such patients become frightened, and having once obtained

relief would have you withdraw air every little while.

Those patients in whom the temperature and pulse soar are well illustrated by this case where the temperature rose to 104.5 degrees and the pulse to 140, though we doubt the advisability of giving digitalis in this time of cardiac stress.

The cough is always the same; it is short, sharp and persistent—the cough of pleural irritation. When pressure is such as to displace the main bronchi, coughing may become paroxysmal in character. After the severity of the accident is over the patient will cough much less than before the break occurred, but the diminution may not last if the disease again resumes its stride.

Once the residual sputum has been expectorated consequent to spontaneous compression it becomes markedly diminished. In our patient the output dropped from four to two and one-half ounces. Further changes depend upon the progress of the disease.

Every large spontaneous pneumothorax, and many smaller ones produce a symptom about which the literature makes little mention. That symptom is sweating and in the type of which we write it is constant. Anxiety, as evidenced by the facies, is always present and is in proportion to the severity of the pain and the amount of dyspnoea. It is at its height where the ball-valve fistula prevails and at the moment when, air having been withdrawn, the dyspnoea again closes in. At such a juncture only, perhaps, do our patients really envisage death.

The pain at the first, the persistent cough, and the discomfort of being short of breath do not in themselves make sleep unobtainable. It is the mounting stimulation of the higher centres with CO₂ (consequent to the dyspnoea) which we cannot hope to overcome with any drug, which produces insomnia in the bad cases. Pain we can ease, but sleep we cannot give until nature removes her stimulant.

Of the symptoms caused by pressure, pain in the contra-lateral side following the line of the displaced mediastinum is the commonest, and indeed it is seen in most cases of even small artificial pneumothorax. A choking sensation in the throat is another hall-mark of large spontaneous pneumothorax which is not given

prominence in the literature. It is felt near the spot, where the trachea enters the chest and becomes distorted. Dysphagia, although not apt to be complete, should also be a common pressure-symptom and deserves mention, were it only for the disturbing effect which it has on the patient.

So far as the writer has been able to ascertain, in a review of the American periodicals from 1917 to 1927, the following symptoms are either not mentioned, or are barely spoken of by only one or two writers. These are: the sweating, the facies of anxiety, the insomnia (and its cause), the choking sensation, and the paralysis of nerves as met with in our patient, considered above. The ball-valve type of fistula, and the usual rapid onset of fluid, are frequently mentioned, particularly with regard to treatment and prognosis.

It is well, if possible, to leave the fluid which forms, in the hope that it will facilitate the closure of the valve, and also because withdrawal stimulates its formation, with the consequent increase of pressure. The more frequently one interferes, the greater are the chances of infection.

The prognosis of these cases is well gone into in the literature, with the exception of figures. Ball-valve fistulæ are as apt to re-open in six weeks as in six days.

Treatment consists in the exhibition of narcotics and sedatives to allay the cough and to procure sleep when the dyspnoea allows it. Air must be withdrawn in many cases to avert death, and in the case of our patient referred to the respirations would reach 36 before we interfered. Some fluid may have to be removed at first for the same reason. No attempt should be made to remove it all. Later on, it is best to leave the fluid severely alone, for here "expectant treatment" will not lose us a patient but may be the means of saving one, for a time at least and possibly for a considerable time.

CASE 2.

Case 2 illustrates the small type of spontaneous pneumothorax, occurring in pulmonary tuberculosis.

Mrs. De G., aged 24, who had previously seemed to do very well, so far as weight and appearances were concerned, had a bilateral non-clearing and far advanced type of tuberculosis, with râles from apex to base

on both sides. Five months ago she became homesick and left us.

She returned during the winter feeling fairly well, but having lost 20 lbs. in weight. Examination showed less moisture on the left side at both the top and the bottom, and a diminution of the breath sounds over the same areas.

The x-ray plate demonstrated two areas of spontaneous pneumothorax on the left side, one toward the apex and the other at the base, and very likely they communicated with each other.

The patient, who had bathroom privileges, had been pretty well while at home but for a little setback in November, which she thought was a touch of pleurisy and a cold. She was worried about her loss of weight and thus sought re-admission. After close questioning, the "pleurisy," or "cold," as she believed it to be, was, simply, as follows: She had a fairly severe pain in the left side of the chest, for about half a day; there was some dyspnoea and a few chills; the temperature went up to 101 degrees and the pulse to over 100. With this, there had been some increase in cough and sputum to 2 oz. daily, which is never much with her, although she may swallow sputum.

The attack as we have described it lasted about two weeks and was not severe enough to cause the patient a great deal of worry. There was apparently no sweating, insomnia or marked shortness of breath with this collapse.

So far the results are a loss of 20 lbs. in weight, and the fact that the patient does not feel quite so well as before.

The signs and symptoms may be summarized thus: pain, fairly severe but short lived; dyspnoea, sufficient to be noticeable; chills, in place of sweating; elevation of temperature to 101 degrees; elevation of pulse to 100; cough and sputum increased at the time.

CASE 3

Mr. A. W., aged 36. At the time of his accident in November, 1926, this patient had an acute disease involving the upper lobes on both sides. He was running a high temperature, from 99 to 103 degrees, and the pulse went to 100. There were as many as three sweats every night, the cough was very bothersome, and the sputum raised was from three to four ounces in the twenty-four hours. In addition the man had anorexia, malaise, general weakness and loss of sleep.

One afternoon he was seized with a bad paroxysm of coughing. This was associated with profuse sweating and some shortness of breath. The temperature at the same time fell to 95.8 degrees and the pulse to 60. The patient does not remember much of what happened during the next 24 to 48 hours, for he slept a great deal, doubtless from sheer exhaustion. After this the cough became greatly lessened, in fact it practically disappeared, and the sputum decreased to half an ounce daily.

The explanation is that at this time a spontaneous pneumothorax occurred on the right side, of 15 per cent. No air was withdrawn. Fluid did not form, and within four months the air had re-absorbed. The patient has done very well since and has had but few further elevations in pulse or temperature.

Briefly his symptoms were: a paroxysm of coughing; sweating, most profuse; slight dyspnoea; temperature dropping to subnormal; pulse dropping to 60; excessive fatigue, causing

prolonged sleep; ultimate lessening of cough and sputum.

The two preceding cases do not perhaps seem good examples of spontaneous collapse of the lung, and yet for that very reason they are presented as typical of the small accidental pneumothorax, for this class differs only from the large "natural" pneumothorax in its incompleteness, both as to symptoms and extent of compression.

Considering first the pain, we find that it is either slight, as was that of Case 2, or absent, as in Case 3. If there is any appreciable collapse dyspnoea is to be expected. The reverse is also true and neither of these patients had pronounced shortness of breath.

The occurrence of sweating is usual, although Case 2 did not complain of it. Moreover, chills are not an uncommon symptom and are frequently followed by sweating. The effect upon the body heat of a small spontaneous pneumothorax is similar to that of a large one. The temperature of Case 2 rose to 101 degrees and her pulse rate increased to 100, but the rise is not so great as seen in Case 1, who had a much greater shock. On the other hand, from time to time we encounter drops in temperature to subnormal, associated with a slow pulse, and Case 3 is an instance of this.

Both our patients showed the sudden increase in cough at the time, followed by a diminution of cough and sputum. Natural pneumothorax is frequently heralded by a paroxysm of coughing, of which Mr. A. W. and Mr. J., to be spoken of later, are examples. It is understood with regard to the sputum that the expressed sputum must first come away before we see the lessened expectoration, which with improvement persists.

The smallness of this type of pneumothorax precludes the graver pressure symptoms such as choking sensations, dysphagia, and insomnia. In fact the tiredness after such a shock often induces sleep. The facies will not express acute anxiety, but worry is never absent. If one is familiar with the patient, the physical findings, besides a slight lack of resonance and diminution in breath sounds, will show fewer or more distant râles, if there was moisture before, over some portion of the affected side. In eliminating the presence of cavity, should one be seeing such a case for the first time, it will be found

that the patient's symptoms are not commensurate with the size of the supposed cavitation. The frequency of this type *per se* is not, to my knowledge, set forth in the literature, although some interesting x-ray articles occur which speak of the differential diagnoses between small natural pneumothoraces and large outlying cavities. It must certainly occupy a smaller place in our minds with regard to frequency than it might, would "the giftie gie us" unerring knowledge of each small spontaneous pneumothorax.

Nearly all of these patients take care of themselves and the conversion of such cases to artificial pneumothorax will but increase the risk of forming fluid. The progress of the tuberculous patient who sustains a small spontaneous pneumothorax may indeed be poor, but, what is more often the case, is apt to be good and the collapse proves of real benefit.

The following is a case of spontaneous pneumothorax complicating artificial pneumothorax, and illustrates our second type.

CASE 4

Mr. L. S., aged 21, had in 1921 a right-sided disease involving the two upper lobes; and in the middle lobe there existed a cavity the size of an egg. He was taking artificial pneumothorax. In 1920 fluid appeared which was frequently withdrawn; it later became purulent and finally showed tubercle bacilli. The following year a needle-track fistula developed, but with the use of acriflavine to replace some of the pus, and of iodine left in the tissues of the chest wall, this fistula healed up; 400 to 1000 c.c. of pus were being removed at monthly intervals and replaced by air.

On December 14th, 1925, the patient spat up a small amount of yellow stained "fluid". There was a rise in temperature and some pain, but no marked pain in the chest. The suspicion of bronchial fistula was confirmed on December 24th, when a considerable amount of acriflavine-stained purulent sputum was expectorated, containing a few tubercle bacilli, (Gaffky I).

The temperature chart of Mr. S. at this time shows that from December 4th to December 8th the temperature rose from 98.6 degrees to 101.5 degrees, and the pulse from 85 became 105. On the ninth and tenth the temperature came down to 100 degrees and the pulse to 95; the next day 50 c.c. of air were withdrawn. The fever now ran as high as 99 degrees until the 24th when it reached 100 degrees; pulse, 105. On Christmas day the patient was transferred to the care of a surgeon.

The symptoms in this case were not very dramatic; merely a slight pain in the side, increase of cough, and expectoration of purulent sputum, and an elevation of temperature to 101 degrees and of pulse to 105.

A first stage thoracoplasty, involving the first to the eighth ribs was performed. The old year closed with a pleurisy and a root spread on the left side. This side improved sufficiently during 1926 to enable a second stage thoracoplasty to be done the following December, in which sections of the eighth to the eleventh ribs were removed.

The patient, despite some disease on the left side, weighs 196 lbs. He still brings up pus or as he calls it

fluid, from his right side, from time to time and we are reluctantly contemplating the insertion of a permanent drainage tube to enable the fistula to close. The temperature runs about 98.6 to 99 degrees, but with distressing bouts of 100°, of which we hope to relieve him by the insertion of the tube.

The frequency with which spontaneous pneumothorax supervenes upon artificial pneumothorax has been estimated by Swezey and Schonbar³ in a series of 205 cases, as 3.3 per cent, with a resulting mortality of 62 per cent. The 38 per cent remained unimproved, but we must remember that these 205 cases were for the most part far advanced. On the other hand, while Matson and Bisailon,⁴ their series involving 480 cases of artificial pneumothorax, find the occurrence 3 per cent, they also found the consequent mortality but 19 per cent, for they had fewer far advanced patients taking treatment.

The symptomatology of accidental collapse in artificial pneumothorax patients is, to our mind, as follows. Pain is slight and dyspnoea, as a rule, is not pronounced. The elevation of temperature and of pulse is not so great as that seen in other types. Mr. S. showed a rise to 101 degrees in his temperature and the pulse increased to 105.

In these patients cough increases due to pleural irritation, and is also caused in some instances by an increase of sputum where the chest fluid finds its way through a patent fistula to the bronchi. Mr. S. had, and still has, periodically, drainage of his pyopneumothorax fluid through the fistula in his lung and hence by way of the trachea to the mouth. Such patients do not often escape without the formation of fluid which runs an excellent opportunity of becoming the seat of mixed infection, even should it not be spat up later.

In this type startling pressure symptoms are not to be expected, for the compressed lung is apt long since to have developed adhesions which prevent an extensive collapse. For the same reason the symptom of sleeplessness is not in evidence except as the usual insomnia of a nervous phthisical individual who has just suffered an accident.

The facies must show worry but not the fear of one who is upon the "brink" with a large spontaneous collapse of the lung.

The physical evidences of the accident depend as before on the extent of compression; and while the appearance of acriflavine or

or methylene blue-tinted sputum is not *prima facie* evidence of a bronchial fistula, when the foreign colour becomes more than a tint and is intracellular in an increased sputum it behoves one to be suspicious.

The treatment is thoracoplasty, if this is at all feasible. Such patients as Mr. S. was in 1923, when he developed a needle-track infection, would be far safer if they had thoracoplasty performed then, for too often they develop later on a bronchial fistula.

CASE 5

A Mr. J., aged 24, is a patient illustrating a large spontaneous pneumothorax, in which there was no demonstrable evidence of tuberculosis.

Two years ago this man was ill for a few days with pleuritic pain and was strapped with adhesive plaster. He also had three ribs broken several years ago on the same, that is the left, side. Of family history there is only this, that, since his accident one sister has developed pulmonary tuberculosis with positive sputum. He was a young business man who had shortly before the accident driven two hundred miles in a car. Suddenly, whilst singing, he was seized with a choking feeling in his throat, about the region of the episternal notch, which caused him to double up and sit down. At the same time he became very short of breath, and at each attempt to straighten up a pain of a tearing nature came on, which forced him to desist.

He states that he perspired considerably at the time, particularly about the forehead, but this lasted only half an hour. He was much alarmed fearing that he had had a heart attack. That night he retired early and slept well, and next day was driven the two hundred miles home in fair comfort, except that whenever the car struck a bad rut it produced a pain in his chest.

So far as he can tell me there was no flushed feeling to suggest that he had a fever, but his heart did seem to beat faster after the accident. The next day, after reaching home, he drove 25 miles to this sanatorium for x-ray examination, etc., where it was found that he had a 75 per cent collapse of the left lung. The dyspnoea and choking sensation passed away three weeks after the accident, and in six weeks the lung was fully expanded again, as seen by x-ray.

At home the patient did no work and took considerable rest in bed, and two months after the accident, he was apparently in good health although somewhat nervous, but with little if any physical signs to indicate that either side of his chest might be diseased or recently disordered.

His symptoms may be summarized as follows: a choking sensation in the throat; dyspnoea, sudden and marked; pain in the chest, tearing in character; sweating, considerable but over a short period; anxiety; pulse rate probably elevated; temperature probably not elevated very much, if any.

CASE 6

Miss K. S., aged 23, illustrates the gradual onset of a large spontaneous pneumothorax in

a woman having no demonstrable evidence of tuberculosis.

At the time of the accident (in 1919) she was a big strong athletic type of girl, weighing 150 lbs. For six days she noticed that she was gradually becoming shorter and shorter of breath, and on the seventh day the dyspnoea was so marked that she sought medical advice. The x-ray demonstrated a collapse of all three lobes on the right side, amounting to 90 per cent. She resumed her usual home life and six weeks later breath sounds were again normal over her chest, and the lung had re-expanded as seen by fresh plates.

In 1923, and again in 1925, this same curious phenomenon recurred. At no time was there any evidence of pulmonary tuberculosis. So far as I can find out none of the other symptoms of spontaneous pneumothorax appeared.

When we consider the occurrence of a spontaneous pneumothorax in people who have no tuberculosis or any other apparent cause to account for this strange happening we are apt to say with Hamlet: "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy." We may say that there must have been a small ulcerative process, or that an adhesion has been torn, or we may just say nothing.

The frequency with which this happens is not at present reduced to figures. C. W. Hayes, in the article before quoted, speaks of having found 60 cases mentioned in the literature prior to December, 1923, and it is likely that most or all chest specialists in Canada have seen such cases. The writer has seen only one spontaneous pneumothorax of this type. In this man (Case 5) the cause, or what we may speak of as the cause, is not out of the ordinary. There was a history of pleurisy and of trauma having occurred previously on that side, and it developed later that there was tuberculosis in his family. It is worth mentioning, at least, that two things calculated to cause trouble in a diseased chest had been done shortly before and at the time of the accident. They were a long car drive and the act of singing.

Coming once again to the symptoms of large spontaneous pneumothorax. There are found the pain, which is here definitely tearing in character; the dyspnoea also sudden and marked; and the sweating. Due to the circumstances, we cannot stress the action of the body temperature or the pulse rate, nor can we enlarge on the cough and sputum, for there was none. But the choking sensation and the anxiety were definitely present. There was apparently no lock of sleep and no dysphagia or pain in the opposite side. Fluid did not form, and in the usual time, which is from six to ten weeks, the lung re-expanded.

Case 6 illustrates still another point—that the leak may be very gradual, spread over a period of seven to ten days; and this seems to the writer more in keeping with the classification of no demonstrable tuberculosis, although it is, perhaps, rarer. Nor is this the only patient on record who repeated this performance.

In treating these people, if they allow themselves to be advised, it would certainly not be amiss to place them under a regimen in which they abstain from all physical labour and take fifteen hours of bed rest a day for a period of six months. Their progress seems to be uniformly good.

If it is possible to prove a tuberculous origin then the individual falls in the group which can be treated.

In closing, the author would like to express his debt to Dr. Russel J. Collins of Riverglade, N.B., for the latter's teachings and for the stimulation given to produce this article, which may, we hope, produce a still further study of the subject of spontaneous pneumothorax.

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AN ANTIDOTE FOR MORPHINE POISONING.—Dr. F. E. Loewy writes: It is of considerable practical importance, but not yet sufficiently appreciated, that we possess a powerful stimulant of the respiratory centre—the alkaloid lobeline, which is now available in sterilized ampoules, and can be used safely under precautions. It has proved very effective in poisoning by morphine, hyoscine, and other depressants of the respiratory centre, and should certainly be given in cases like those reported by Mr.

A. E. Mortimer Woolf on March 16th (p. 499), when respiratory failure occurs after the administration of heroin. An ampoule of 1/20 grain should be injected intravenously very slowly, drop by drop. The effect is immediate but transient, and the injection may be repeated every ten to fifteen minutes. Intramuscular or subcutaneous injection of 3/20 grain is also very useful, but less reliable. Lobeline should be at hand in every operating theatre.—*Brit. M. J.* 1: 796, April 27, 1929.

ETHYLENE ANÆSTHESIA*

BY C. E. TIPPING, M.B. (Tor.)

*Chief Anæsthetist to St. Joseph's Hospital,**Toronto*

IN the past three or four years considerable research work has been carried on with this comparatively new anæsthetic gas—ethylene. In fact, there has been so much said in its favour that there is little for me to add. Ethylene has some few disadvantages which are far outweighed by its superiority over any other anæsthetic agent. If it had not been heralded as a highly explosive and dangerous gas, I feel sure it would be in more general use to-day. My opinion of ethylene is based on careful observation of its effects in one thousand cases of anæsthesia, covering a wide range of operations, from a simple abscess to abdominal Caesarean section followed by hysterectomy in an eclamptic patient. The ages of the patients varied from a few months to fourscore years.

Ethylene, or olefiant, gas was probably first used as an anæsthetic agent as early as 1849 by Nunnelly, and, later, by various workers on animals. It was not until 1918, however, that serious study was first given to it, by Luckhardt and Thompson, whose first experiments were performed on frogs, rats, and, later, dogs. This work was also carried out by Eason Brown,¹ and to him belongs great credit for its practical use to-day. In 1923, Luckhardt and Carter² reported the first 106 cases operated upon under ethylene at the Presbyterian Hospital, Chicago. Since that time ethylene has come into popular use, and is used at the Mayo Clinic, the Lahey Clinic, and other large surgical centres, both in Canada and the United States.

Ethylene is an unsaturated hydrocarbon gas, and liquefies at ten degrees C. under 60 atmospheres pressure. It burns with a luminous flame, and with a certain percentage of air or oxygen forms a highly explosive mixture. It has a peculiar odour, described by some as that of wet matches, and although unpleasant at first, one soon becomes accustomed to it. In weak dilutions (1:5000) it has been used to ripen fruit. In its preparation one of the great-

est difficulties has been to eliminate carbon monoxide from the gas. By recent delicate methods, this has been accomplished. The gas is shipped in the usual steel tanks under high pressure.

The surgeon who is accustomed to operating on patients anæsthetized with ethylene rarely has any complaint to make. It is usually the surgeon who is unaccustomed to gas anæsthesia, or one who lacks manipulative ability, that experiences difficulty with ethylene anæsthesia.

With the administration of ethylene we have found that the success of the anæsthesia obtained, and the best post-operative results are only in evidence when proper premedication to suit the individual case has been employed. We have met with success at St. Joseph's Hospital, Toronto, using morphia gr. $\frac{1}{4}$, which has a better effect when combined with atropine gr. 1-150, one half hour before operation. In laparotomies and thyroid operations we give morphia gr. $\frac{1}{4}$, and hyoscine gr. 1-200, one and one-half hours before operation, the morphia being reduced in some cases.

Anyone familiar with gas anæsthesia can quite safely administer ethylene. The gas is administered with any of the usual types of gas machines, and I believe that the machine has little to do with the success of the procedure, provided that the anæsthetist is familiar with the machine he is using. We use the usual rubber face-piece. Inform the patient that after a few breaths sleep will be quickly induced, and hold the rubber face-piece, with the exhaling valve open, fairly close to the face. As consciousness is lost, the face-piece is pressed close to the face. The mixture to start with is 90 per cent nitrous oxide (to eliminate the odour of ethylene) and 10 per cent oxygen. After a few breaths I stop the oxygen for one or two breaths, and then turn on a mixture of ethylene 90 per cent, and oxygen 10 per cent, and close the exhaling valve.

Respiration is regular. Struggling, or even moving of the legs or arms, is of rare occurrence. If the colour is good, I maintain this mixture until surgical anæsthesia of the proper depth is

*Read before the Section of Anæsthesia, Academy of Medicine, Toronto, February 28, 1929.

obtained. It is in the interest of the patient to maintain a high oxygen percentage in the mixture. The mixture is therefore varied to give the maximum amount of oxygen. This usually results in smooth anæsthesia being maintained with a mixture of 80-85 per cent ethylene and 15-20 per cent oxygen. I have the patient rebreathe about three-quarters of the time. The use of the exhaled carbon dioxide in this manner gives a smoother anæsthesia, requires less ether (if any) and is more economical. The better the preliminary medication, the higher is the percentage of oxygen that can be given. If after the skin incision has been made, the blood appears dark, (in spite of a pink colour of the skin) increase the percentage of oxygen.

In about 70 per cent of all cases ether is unnecessary. If relaxation is not sufficient, ether is administered, maintaining the same gas mixture. Let me state here, that if it is necessary to give ether, give it in sufficient quantity rapidly, and this will suffice for the remainder of the operation in the majority of instances. I have seen nitrous-oxide-oxygen given with the ether pet-cock turned on part way during the greater part of the operation. Surely this is not good gas anæsthesia. It has been my ambition to obtain anæsthesia with a minimum amount of ether, and with ethylene I feel that this can be accomplished. When the skin is being sutured I change over to a mixture of 90 per cent nitrous oxide and 10 per cent oxygen, and open the exhaling valve, and continue in this manner until the operation has been completed. The bag is then emptied and filled with oxygen. I find this eliminates the odour of ethylene which the patient might object to on regaining consciousness, and also the headache, which so often follows any gas anæsthesia.

The effects of ethylene anæsthesia on the patient are such that no one, observing the patient carefully on the table and after returning to the ward, can fail to appreciate its superiority over other anæsthetic agents. The patient does not lose such a quantity of fluid from sweating, so common to other anæsthetics. The body temperature does not drop, and the colour remains good. In the matter of nausea it compares favourably with nitrous oxide. There is practically no effect on the basal metabolic rate. The kidney function may be slightly reduced.³ There is no effect on the liver. I have administered ethylene in active lung cases without any noticeable harmful effect. In heart lesions its

beneficial effects are probably due to the slow pulse rate. Ethylene is eliminated very rapidly from the lungs. It has less effect on blood pressure than any known anæsthetic. There are no gas pains, yet peristalsis returns very rapidly.

To estimate the advantages of ethylene, let us consider these under the various types of operations. For thyroid surgery the minimum effect on toxic cases is most beneficial. The patient is easily aroused from the light anæsthesia. The oxygen percentage can be maintained at a high level, without the use of ether. In over one hundred cases we have never found it necessary to add any ether. These patients usually have a high basal metabolic rate; this is not increased under ethylene. The slow pulse rate is certainly beneficial to the already overtaxed heart. Others may disagree, but I am convinced that ethylene is the anæsthetic of choice, not excepting local anæsthesia. For gall-bladder surgery, in which condition there is always some degree of hepatitis, the absence of any effect on the liver tissue hastens convalescence.

In obstetrics the greater relaxation obtained with ethylene tends to shorten the second stage of labour and eliminates the possibility of laceration of the pelvic floor. For dental work the jaw is relaxed with lighter anæsthesia, and the anæsthesia is not so deep as with nitrous oxide. For fractures it can be used for manipulation to advantage in debilitated subjects, but not where the x-ray has to be used at the same time. Diabetics seem to take ethylene without any deleterious effects.

I have purposely left the disadvantages of ethylene to the last, believing them to be of minor import. Regarding its odour, I have never had a patient complain of this; I have administered it to several surgeons, and they would be the first to complain. The odour can be eliminated by starting and finishing with nitrous oxide.

The other possible disadvantage is involved in the question of explosiveness. Dr. Eason Brown, in a verbal communication, informed me that, in his opinion, it would take twelve hours of continuous use of the gas in a closed operating room before the mixture with the air would be explosive. Other writers⁴ state that the mixtures as used for anæsthesia are not explosive. John K. Mabbs, research engineer, after exhaustive research, reports that "The relative explosion hazards of ether and ethylene when mixed with

air or oxygen are practically equal." According to the United States Bureau of Statistics, ethylene is no more explosive than ether, in the mixtures used for anæsthesia.

No doubt there have been explosions, I know of one very serious one, but in all these instances there has been carelessness in using the actual cautery or in leaving the tanks turned on or the bag full at the conclusion of the operation. I have on two occasions unwittingly administered ethylene with an open flame, within four feet of the gas machine, without disastrous results. However, while still under suspicion, we should take all the precautions available when using ethylene. To this end there is an excellent system of grounding the machine described by Isabella Herb, and this method is used in the Presbyterian Hospital, Chicago, where so much ethylene is used. Horner and Gardiner⁵ state that carbon dioxide lessens the chance of ex-

plosion, and suggest flushing out the machine with carbon dioxide before using ethylene. Personally, I have not felt it was necessary to be more cautious than when using ether.

The perfect anæsthetic agent should satisfy the patient, the surgeon, and the anæsthetist. Every agent known seems to fail in one respect or another. In ethylene I believe we have an anæsthetic agent which satisfies to the greatest extent all three persons concerned, and feel that this is gradually being shown by the increased number of anæsthetists advocating the use of this anæsthetic.

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THE INDUCTION OF LABOUR

BY WALTER R. FLETCHER, M.D.,

Montreal

THIS article is a review of all the cases of labour induced by bag or bougie occurring in the Royal Victoria Montreal Maternity Hospital and the old Montreal Maternity during the past five years. It is intended to show the actual time taken when labour is induced, together with other facts.

From 1923 to 1927 inclusively there was a total of 240 cases, of which 206 cases (or 86 per cent) were bag-inductions, and 34 cases (or 14 per cent) bougie-inductions, showing how much more frequently the bag method was employed.

The indications for these inductions by the bag method are shown in Table I. It will be noted that toxæmia heads the list, with 47 per cent. Under toxæmia have been grouped, eclampsia, albuminuria, hypertension and pernicious vomiting. Disproportion stands second, with 20 per cent. This was almost entirely due to the various types of contracted pelvis. The third largest group is hæmorrhage, which includes placenta prævia, premature separation of the placenta, and also low implantations,

with 14.1 per cent. These three large groups constitute 81 per cent of all the indications.

Table III shows the complete duration of induction, the duration of the bag only and the duration of the pains, for all cases, and for both primiparæ and multiparæ. The complete duration of induction is from the time the bag was

TABLE I
INDICATIONS FOR BAG-INDUCTION

Indication	No. of Cases	Percentage
1. Toxæmia	97	47.1
2. Disproportion	42	20.4
3. Hæmorrhage	29	14.1
4. Clinical (demonstration purposes)	9	18.4
5. Pyelitis	5	
6. Cardiac conditions	5	
7. Post-maturity	4	
8. Mal-presentations	3	
9. Pulmonary tuberculosis	2	
10. Unknown	2	
11. Epilepsy	1	
12. Toxic deafness	1	
13. Deformed coccyx	1	
14. Acute arthritis	1	
15. Ovarian cyst	1	
16. Dry labour	1	
17. Rigid cervix	1	
18. Weak abdominal walls	1	

introduced until the birth of the baby. The duration of the bag only is from the time it was introduced until it was expelled. The duration of the pains is from the time the pains began, following the introduction of the bag, until the birth of the baby.

TABLE II
INDICATIONS FOR BOUGIE-INDUCTION

Indication	No. of Cases	Percentage
1. Toxemia	14	41.1
2. Disproportion	8	23.5
3. Clinical	2	64.6
4. Prophylactic	2	
5. Hydramnios	2	35.4
6. Post-maturity	2	
7. Cardiac conditions	1	
8. Insanity	1	
9. Varicose veins	1	
10. Sarcoma	1	

Note the absence of hæmorrhage as an indication.

TABLE III

	Total Cases	Primi-paræ	Multi-paræ
Complete duration of induction	23.9 hrs.	33.8 hrs.	17.7 hrs.
Duration of bag only	18.3 hrs.	25.1 hrs.	13.7 hrs.
Duration of pains....	15.8 hrs.	23.0 hrs.	11.5 hrs.

Table IV shows the same thing for bougie-induction.

TABLE IV

	Total Cases	Primi-paræ	Multi-paræ
Complete duration of induction	40.1 hrs.	52.2 hrs.	26.8 hrs.
Duration of bougie only	26.1 hrs.	37.7 hrs.	13.6 hrs.
Duration of pains....	21.0 hrs.	32.9 hrs.	10.8 hrs.

In 5 cases the bougie method of induction failed and the bag was resorted to.

It is usually taught that a bag induction takes only about ten hours, but these figures go to show that it takes a considerably longer period. It will be seen that in primiparæ the time taken for induction by either method is doubled in comparison with multiparæ.

The danger of a bag-induction is a prolapsed

cord. This occurred in 13 cases, or 6.3 per cent. Of these 13 cases, 8 babies were born alive and 5 were dead, making a fetal mortality of 38.4 per cent from prolapsed cords.

The maternal mortality for the 206 cases of bag induction was 1.94, or nearly 2 per cent; and the infant mortality was nearly 23 per cent. Twenty-nine per cent were classed as "febrile," the temperature having reached 100.6° on one or more occasions.

There were no maternal deaths for the 34 cases of bougie induction; the infant mortality was nearly 15 per cent, and 18 per cent were febrile.

The technique for bag-induction, as carried out in this hospital, is as follows:—

The patient is given an enema and then shaved. She is then placed in the lithotomy position and the vulva and vagina scrubbed with green-soap and sterile water, followed, after catheterizing, with biniodide solution. The cervix is exposed by a posterior retractor, and grasped and pulled down with a tenaculum forcep. Dilatation is accomplished by Hegar's dilators, so that the index finger may be inserted and the membranes gently stripped back. The bag is then rolled tightly, and grasped by a special type of forceps for introducing. It resembles Tarnier's forceps on a small scale, and has a special sliding lock, so that the blades may be easily disengaged by merely pulling back the anterior blade about one-half inch. The bag is introduced and partially filled with sterile water by a rubber bulb, similar to that seen in enema sets. The forceps is then removed and the bag completely filled and the stem tied. Packing is usually inserted around the neck of the bag and into the vagina. A one pound weight is attached to the bag after the pains have begun.

THE OSLER CLUB.—The Osler Club celebrated its first anniversary at a meeting held on Tuesday, April 30th. The secretary, presenting his report for the year, paid a tribute to the splendid work of the club's foreign secretary. Sir Farquhar Buzzard, in a paper on the history of neurology, traced the growth from neurological aspects of other sciences of the independent science of neurology, for which he foresaw a future of great importance in the elucidation of the problems of education. Mr. Falconer Madan charmed the meeting with an address on Osler and Burton, full of the rare fruits of his wit, wisdom, and scholarship. Dr. J. D. Rolleston

gave a brief account of the life and work of Billroth, and Sir D'Arey Power and Mr. W. G. Spencer took part in the discussion. The club's collection of Osleriana was exhibited, together with portraits and works of Burton and of Billroth. Among those present were Dr. H. Morley Fletcher, Professor Gask, Dr. G. B. Harrison, Professor Fraser-Harris, Dr. Schroeder (of the Anglo-German Academic Bureau), Mr. Geoffrey Keynes, Dr. A. P. Cawadiaz, Mr. Hugh Cairns, Mr. C. Wilson, the Conservator of the Wellcome Historical Medical Museum, the librarian of the Royal Society of Medicine, and Mr. Philip Franklin.

DIATHERMY IN MORBID CONDITIONS OF THE ARMS AND LEGS

BY JOHN HUNTER, M.B.,

Toronto

HHEAT is so universally employed for the relief of pain that the use of diathermy (conversive heat which can be produced in all the tissues by means of friction between the cells and swiftly moving electrons) is practical, logical, and scientific. It is very easily applied, and, unlike hot applications, the temperature does not vary. Its great potency as an analgesic makes its use logical, and the production of a high frequency current (a million or more oscillations a second) that can be safely used as a remedial measure is an advance that should be duly recognized.

The following are some of the effects produced by diathermy: (1) dilatation of arterioles and capillaries; (2) physiological hyperæmia; (3) increase in functional activity of cells.—metabolic and katabolic; (4) elimination, through a more active arterial, venous, and lymphatic circulation; (5) increase in functional activity in both visceral and endocrine glands; (6) relief of hypertension in both striated and smooth muscle tissues; (7) potent analgesia; (8) safe and efficient hypnosis; (9) restoration of mental and physical well-being.

The following cases may be advanced as illustrating the value of diathermy.

CASE 1

A medical man aged 89, with a history of traumatism of the ankle. The patient had been under medical care for two months when referred for treatment by electrotherapy. The foot, ankle, and the leg as high as the knee were much swollen, with superficial ulceration of sections of skin. The patient was exhausted from loss of sleep, and appetite. Diathermy was employed—one electrode (smaller) on the sole of the foot, the other above the knee, and heat to toleration for half an hour. This treatment was given daily for a week, then tri-, and bi-weekly; later weekly for two months. The pain was promptly relieved, appetite and sleep returned, and the patient was able to walk. Three months later he said that the "ankle was the better of the two." Six months later the right forearm and hand became disabled; there were pain; swelling of the forearm and right hand; and loss of the special senses—touch, heat, cold, from arteriosclerosis of the ulnar and radial arteries; he could not button his coat owing to loss of sensation of touch. The circulation in the radial and ulnar arteries was greatly impeded from arteriosclerosis. Diathermy was used, one electrode placed on the arm, the smaller one on the hand. Sufficient collateral arterial circulation

was obtained to completely relieve the morbid conditions. Sensation and functions were restored and retained.

CASE 2

This patient was a female, aged 72, with arteriosclerosis of the anterior and posterior tibial arteries. Signs and symptoms of impaired circulation were noticed in 1924. She was under medical and surgical treatment until June, 1927. Amputation at the ankle was proposed. The patient showed all the classic signs and symptoms of gangrene. A very conservative prognosis was given—a possibility of establishing a sufficient collateral arterial circulation to supply the foot and toes. The foot was submerged in a warm saline solution, and an electrode placed under the sole, also a larger one above the knee; heat to toleration was applied for half an hour. The foot became warm and the pain was relieved. Treatments were given daily for two weeks, then tri-, bi-weekly and weekly for two months. During this time deep fissures extending the full length of each toe (plantar surface) and one encircling the little toe healed. Normal conditions and functions were restored at the end of four months, and are still retained.

CASE 3

A female, aged 18, previously healthy. About ten hours after an injection had been given (on account of exposure to scarlatina) she felt a severe pain in the back of the neck, and next morning the left deltoid was paralyzed. She could not abduct the arm, and it would fall helplessly when raised. She was under the care of her own physician at first, and later tried a chiropractor and an osteopath. No improvement in function followed, but there was some atrophy of the deltoid at the end of the fourth month. Diathermy was used, an electrode 2-12 being applied over the cervical and upper dorsal region, and one on the palm, with the hand submerged in warm saline solution. Complete restoration of function and of metabolism of the deltoid resulted within two months. She was able to swim.

CASE 4

A female, aged 34, received a deep puncture in the mid-tarsal region from a rusty nail. The signs and symptoms of an acute infection quickly followed. She was treated at home for twenty-four hours. The patient walked from her car into the office on crutches, with one leg sharply flexed at the knee. Reddish lines extending along the dorsum of the foot and up the anterior surface of the leg to the knee, which were painful on pressure. An electrode was placed on the sole of the foot, which was immersed in a saline solution, and another above the knee. The heat completely inhibited further infection, and about forty-eight hours after first treatment, while the foot was immersed in hot water, there was a painless and very free discharge of pus through the puncture made by the nail. The patient resumed her vocation (dining-room service) next day, and complete recovery resulted within a week.

CASE 5

A male, aged 18. While working in a planing mill he was struck on the upper anterior surface of the

thigh. Home treatment was tried for three days, and when he called signs and symptoms of a large abscess were found, which was freely opened and drained. Prompt relief was given, but four or five days later signs and symptoms of a deeper infection involving the periosteum appeared. Striving to avoid, if possible, the necessity of making a deep incision, diathermy was used. The patient was asked to endure a rather intense sensation of heat in order to inhibit infection in the deeply seated tissues. The first treatment relieved pain and inhibited any further infection. Three more were given within two days. The result was complete recovery without suppuration.

CASE 6

A female, aged 20, previously healthy. The left knee became acutely inflamed from an unknown cause. The classic signs and symptoms of inflammation appeared. Diathermy was used about six times, but the pain was so much relieved after the first treatment

that she continued her work in a factory, walking several blocks each day, and bowling at night.

An interesting incident occurred while the writer was treating this case. Another young woman was under treatment for the relief of pain from ankylosis of the knee joint. She said that her knee had become acutely inflamed a year ago. Several laboratory tests were made, but no specific cause found. A plaster cast was applied, and when removed two months later the joint was ankylosed. Readers can place their own valuation on the forms of treatment used in these two cases.

Case Reports

A CASE OF EXTENSIVE ATROPHY OF THE SUBCUTANEOUS FAT FOLLOWING INJECTIONS OF INSULIN*

BY I. M. RABINOWITCH, M.D.,

Montreal

Atrophy of the subcutaneous fat in diabetics, following the injection of insulin, if carefully sought for, is not a rare condition, though, to date, there are less than twenty-five cases reported in the literature. A summary of all the recorded cases, including those previously re-

ported in this *Journal* by the writer, was recently reported by Avery.¹ Carmichael and Graham suggested that this condition might be due to the insulin itself, because of the presence of minute amounts of fat-splitting ferments, since insulin is prepared from the pancreas. In view of this suggestion, the writer, as previously reported,² concentrated large volumes of insulin at low temperature and under reduced pressure, and even under these conditions was unable to detect any lipase. Avery concludes from his studies that the subcutaneous fat atrophy is a non-specific reaction and is the result of repeated traumata to the panniculus adiposus and suggests that the con-

* From the Department of Metabolism, The Montreal General Hospital, Montreal.



FIG. 1



FIG. 2

dition be called "traumatic atrophic panniculitis." There is nothing remarkable about such patients otherwise, either from the clinical or laboratory aspects. The condition appears to bear no relationship whatever to progress or prognosis.

The following case report is added to the literature for two reasons—firstly, it is the most marked that the writer has met with, and, secondly, it bears the first photographs of the condition to appear in this *Journal*.

Briefly, the patient (Hosp. No. 3824/25) is

a female, 26 years of age, who has been receiving insulin since August, 1925. There is nothing of special interest either in the clinical or laboratory data, with the exception of the fat atrophy. In spite of very severe diabetes prior to the institution of insulin treatment, she has since given birth to a healthy child and the course of the pregnancy was uneventful.

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HAIR DYES.—It is true that the harassed medical student has not yet to be "signed up" in hair dyeing before he may satisfy his examiners that he is fit to practise, but the subject is by no means devoid of medical interest. Never before in the history of the world would people seem to have been so reluctant to accept philosophically the approach of old age; never so much as to-day have the resources of the chemist been made to serve the desire to maintain a youthful appearance. While, however, the chemist may take some pride in the efficiency of the innumerable dyes which have been devised to mask the presence of white hairs—so shattering, apparently, to the illusion of youth—the physician's interest is engaged by the fact that many of the chemicals employed are far from harmless and that his services are sometimes invoked to treat cases of poisoning brought about by their application. Notwithstanding the efforts of the practitioners of cosmetic arts to veil their proceedings in mystery, a great deal of information bearing on the subject may be gleaned from the trade publications serving the members of the hairdressing profession and from scattered papers in various chemical journals. We welcome, however, the publication of the book which bears the intriguing title *Blonde or Brunette?** for within its small compass the authors have collected, and presented, simply yet scientifically, all that the medical man needs to know about this subject. It is interesting to read that henna, which has enjoyed a high reputation since Biblical times, and is still largely used for cosmetic purposes, might be considered the ideal hair dye, but for the fact that it requires more skill in its application than some other substances. Successfully applied, it gives a wide range of good colours, and has the great advantage of being perfectly harmless. To-day the ideal hair dye must not only produce with safety a permanent colour, natural in appearance, but it must not render the hair less respon-

sive to the treatment known as permanent waving. In this respect the metallic dyes fail, though all of them which depend for their action on the reduction of silver or some other metal by a solution of pyrogallol are in other respects quite satisfactory. It is on account of this unfortunate defect in the metallic dyes that hairdressers are greatly tempted to employ the convenient dyeing agent paraphenylenediamine (known to the trade as "para"), which is endowed with all the attributes of the perfect hair dye, except that it is extremely toxic to susceptible persons. In these it produces a virulent dermatitis, which may extend far beyond the area of its application, and has even been known to affect the whole cutaneous surface. If, moreover, the victim of an attack is so foolhardy as to risk further contact with the exciting substance she will suffer even more severely than she did the first time. The fact that only 1 per cent of healthy persons are susceptible encourages many hairdressers to risk using this chemical without testing their client's sensitiveness. The test is carried out quite simply, by applying a small quantity of "para" to the skin behind the ear and waiting twenty-four hours for the possible development of erythema. If the skin remains normal in that time the dye may be applied with safety. The fact that paraphenylenediamine gives the required tint almost instantaneously, while pyroreduction dyes require forty-eight hours to achieve their effect, is an additional source of temptation to the hairdresser, especially when a client demands cosmetic treatment before attending a social function the same evening. The toxic qualities of "para" are so well known to the trade that hairdressers have occasionally tried to escape the wrath of poisoned clients by denying its use, alleging that they had applied a dye of the pyro group; this defence, however, can never deceive those who know the instantaneous tint produced by the former and the delayed action of the latter. Pyro-reduction dyes are irritant only if the pyrogallol solution is of excessive strength. Medical men who desire to know more of the technique of hair dyeing, the chemistry of the dyes used, and their effects on the health and appearance of the hair, would do well to consult this concise treatise.—*Brit. M. J.* 1: 1048, June 8, 1929.

* *Blonde or Brunette?* By H. Stanley Redgrove, B.Sc., A.I.C., and Gilbert A. Foan, President of the Hairdressers' Trade Parliamentary Committee. London: W. Heinemann (Medical Books) Ltd., 1929, 7s. 6d. net.

Editorial

MEDICAL EDUCATION*

OF the several sources of information investigated by the Commission on Medical Education, in search of suggestions for the improvement of teaching, not the least interesting were the licensing boards. These testify to such improvement in the preparation of candidates that only five per cent of recent graduates failed in 1925, as compared with more than sixteen per cent in 1905. Some State Boards are of the opinion that it is now safe to eliminate examinations in all but the clinical subjects (a common practice in Canada), except in the case of candidates from other than Class A schools. From one State board comes the very shocking statement: "The medical licensing examinations, as such, are not worth a finker's damn." (Our ample apologies to the super-sensitive.) Others are both less frank and less positive in this and other particulars. Some Boards are critical, not only of their own methods but also of the methods of the schools. A rather common complaint is that students are not prepared to deal with minor maladies, but the outstanding criticisms are directed against the teaching in therapeutics and preventive medicine. In respect of therapeutics, the Commission reports that a number of the examiners comment on the *fact* (our italics) that in some instances they still use for examination methods of therapeutics which have been abandoned! This illuminating statement does not weaken the position of those who contend that licensing bodies should, instead of examining candidates, maintain a strict appraisal of teaching faculties and admit to licensure only those who are graduates of satisfactory schools—men whose diplomas are sufficient guarantee of competency and suitability—so that they need not be submitted to a "Board" examination under such an arrangement. The cult schools might present a problem, but they would be none the worse

for a check-up by licensing boards similar to that suggested for the regular schools.

A few years ago much was said in condemnation of examinations as usually conducted. Most of those who cried out for reform in this particular wearied in their well-doing and little has been heard about it of late. And the geniuses who could devise simplified, psychological, and other ornately-named methods of examination, have ceased such highly specialized activities. Of course, even the most enthusiastic champion of the examination could not proclaim it as an infallible test, nor could he condone freakish methods which, while delightfully easy for both candidate and examiner, are little more than tests of the accuracy of quite recent acquisitions of memory. Questions so worded as to give the candidate opportunity not merely to recall facts but also to marshal them in logical sequence and to use them reasoningly and judiciously are, perhaps, the best devices at our disposal for determining the candidate's fitness. Those who are inclined to "flop" at such an examination are likely to "flop" in any emergency and require immunization against a tendency so subversive to success in practice. How could immunity be conferred more innocently or more conveniently than by the examination? The Commission declares that "comprehensive examinations are an effective instrument to stimulate the student to assemble, organize, correlate and present his knowledge of a subject or problem, and should be more generally used." All of which indicates that the examination is not merely a test of potentiality but perhaps more emphatically an instrument for teaching.

After he had sheared the pig, the devil admitted getting much cry but little wool. Whether or no those who would eliminate the lecture are to succeed in doing more than to elicit an outcry is a question to be answered in the future. The outcry of those *pro* the lecture is really no greater than that of the

*The first editorial by Dr. Hattie on this subject appeared in our May issue, and the second in June [Ed.]

cons, and it is difficult to say which side has the advantage. But it is interesting to note the concern which has been created by the discovery that the lecture is comparable to spoon feeding. Soups certainly, and oatmeal porridge, possibly, are nourishing foods which cannot be conveniently or profitably eaten with a knife and fork. Are they therefore to be eliminated from the menu? And must one who is once spoonfed be always spoonfed? Not many years ago the quiz was advocated as a substitute for the lecture, but it has been found that a talent for quizzing is just as necessary for good quizzing as a talent for lecturing is necessary for good lecturing. Now seminars or conferences in small sections are held up as ideals. Will such eliminate the danger of spoonfeeding? We trust that there may not be any tendency to dogmatize in respect of teaching methods. Because a seminar is a seminar it is not necessarily effective. A good lecturer may be a wretched quizzer. It must not be forgotten that there are diversities of gifts. "If the whole body were an eye, where were the hearing? If the whole were hearing, where were the smelling?"

By the simple process of making a virtue of a necessity, the non-medical teacher of medical subjects has become a feature of our day. His entrance to the domain of medical teaching was not welcomed, but he had to be accepted because qualified men who had taken the doctorate in medicine were not available in numbers sufficient to meet the needs. In general he has proved his worth and has been a conspicuous factor in the improvement of teaching in both the pre-clinical subjects, where his influence has been direct, and in the other subjects, where he has exerted a reflected influence. While he has not been regarded as quite belonging to the fold, he has become more and more necessary to it in proportion to the demand for teachers in the laboratory subjects. And now he is being charged with a full share of the sins laid against the system of medical teaching. When it was argued that a scientific subject should be taught without any special reference to its relationship to medicine, there was comparatively little criticism. Now, however, it is being urged that proper correlation of teaching demands

that all subjects of the curriculum be related as much as possible, and that a sympathetic understanding of the needs of the future practitioner cannot be expected of a non-medical teacher. We feel that this argument would be stronger if no teacher who has completed the medical course could be accused of non-co-operation, and particularly if every teacher were required to be a practitioner—which is obviously impracticable. Just now a few schools are staffed almost entirely by men who give all their time to teaching, where the clinicians may see no patients except in the hospitals associated with the School, and nevertheless such schools can be identified as real medical schools. All of which shows that medical education is mobile, that tradition does not determine everything, and that the complexity of the whole situation grows apace.

One may, by striving, derive much comfort from the thought that there are several ways of killing a cat. Likewise, there are varied means of improving the teaching of medicine. Of the reforms effected thus far, that which has been most generally acclaimed is the elaboration and accentuation of clinical teaching. More and more emphasis is being placed upon the desirability of intimate contact of teacher with pupil—of the closest possible approach to the intimacy of the old apprenticeship days. At the bedside, the small group has replaced the class to a very great extent, and the student sees and hears what, formerly, was reported to him as having been seen and heard by the instructor. The logical development from this is the interne year, which promises to become a universal requirement very soon. It is not hard to envision for each interne an ideal chief—perhaps, even capable of correcting the faults of the teaching in the earlier years. Realization may fall short of anticipation, but there is really more evident hope in the interne year than in any other suggestion that has yet been brought forward. The Commission points out, however, that the character of interne training should not be prescribed by regulatory (*i.e.*, licensing) bodies, and should not be subordinated to the needs of the hospital, but should be determined and supervised by the schools. Moreover, "only about ten per cent of patients are hospitalized, the great majority

are ambulant or ill at home, and the training of the student should take this situation into consideration."

It has been possible, in this short series of articles, to touch upon but a few of the many matters which are commanding the attention of medical educators. Enough has been said to indicate the need of reform, the com-

plexity of the situation, and the greatness of the difficulties to be overcome. Perhaps, too, what has been said will serve to incite more general interest in the work of the Commission on Medical Education. If so, our main objective will have been achieved.

W. H. HATTIE

THE DEDICATION OF THE OSLER LIBRARY

AN event of more than ordinary importance, not only to McGill University and Montreal but to educational Canada at large, took place on the twenty-ninth of May when, with all due academic pomp and circumstance, the books so dear to the heart of Sir William Osler were formally handed over to the custody of the University.

The ceremony, which took place in the Assembly Hall of the Medical School was graced by the presence of several members of Sir William and Lady Osler's families:—Mr. H. S. Osler, K.C., Mr. E. H. R. Revere, the Misses Revere, Mrs. H. B. Chapin, as well as of some near relatives, Dr. W. W. Francis and Dr. Norman Gwyn, and Mr. John Chapin. Dr. E. W. Beatty, the Chancellor of the University, presided, and with him on the platform were, Principal Sir Arthur Currie, the Right Hon. W. L. Mackenzie King, Premier of Canada, Professor C. F. Martin, Dean of the Medical Faculty, Canon Chartier, Vice-Rector of the University of Montreal, Professor W. S. Thayer, of Johns Hopkins University, and the Very Reverend Arthur Carlisle, Dean of Montreal. Besides the speakers and members of the Medical Faculty, the four editors of the recently published catalogue of the Bibliotheca Osleriana were present: Dr. W. W. Francis; Dr. Archibald Malloch, the Librarian of the New York Academy of Medicine; Messrs. R. H. Hill, of the Bodleian Library, and L. L. Mackall, of Savannah, Georgia.

After an Invocation by the Dean of Montreal, Dr. Francis, the Oslerian Librarian, gave an intimate and detailed account of the origin and growth of the library, which numbers some 7,600 books, and quoted Sir William's own words, which

tell so touchingly how he came to leave his beloved books to his old college.

Though a wanderer living away from Montreal for more than half my life, I have never forgotten the early associations. The formative years were there with the strong ties of head and heart. As a young, untried man, McGill offered me an opportunity to teach and to work; but what is more, the members of the medical faculty adopted me, bore with vagaries and aggressiveness, and often gave practical expressions of sympathy with schemes that were costly and of doubtful utility. That they believed in me helped to a belief in myself, an important asset for a young man, but better had by nurture than by nature. Alma Mater, too, counts for much, and as a graduate of McGill I am proud of her record. Had I not seen the day of small things? Did I not graduate in the days of the Coté Street School? I may quote Fuller's sentiment: "He (the good Bishop) conceived himself to hear his Mother Colledge always speaking to him in the language of Joseph to Pharaoh's butler, 'But think on me, I pray thee, when it shall be well with thee.' Then there is the natural feeling of loyalty to the country of one's birth and breeding. These are the considerations which decided me to leave the special collection to Montreal."

Professor W. S. Thayer, who had that day been honoured by McGill with its degree of LL.D., a close friend and associate of Sir William's, pronounced a most graceful eulogy on his late colleague, in which he dwelt upon his fine talents, his humanitarian interests and appealing personal qualities. His address appears in the present issue of this *Journal*, and will be read with great delight.

The formal presentation was made, on behalf of the family, by Mr. H. S. Osler, who regretted that, owing to the lamented death of Lady Osler, he had to assume a duty which it had been her keen desire and hope to fulfil herself. He said, also, that it was a great satisfaction to the family to know that through the library Sir William's memory would be kept green in the institution which had given him so much in his early years, and it was their earnest wish that the library would prove of real benefit to the people of this country and to all mankind.

In accepting the gift on behalf of McGill University, Sir Arthur Currie was particularly happy in his remarks, which emphasized the value of books as enshrining the thought of the past and the inspiration for the future. McGill appreciated to the full the honour that was theirs—the honour of being selected as the recipients of this great collection. It was gratifying to know that when the most famous of her medical graduates considered at the end of his days the disposal of his possessions, his thoughts turned home—home to the college in which his footsteps were first guided in the path of medical knowledge. That home received with pride and gladness this gift of its famous son.

We could wish to give in full Sir Arthur's remarks, but considerations of space forbid. The acme of his effort was reached when he spoke of "the Osler tradition." His words here we must not fail to quote:—

We think to-day of his wide learning, which was not narrowed by his enthusiasm for special research, his thoroughness, his exactness, his industry, his inspiring power as a teacher, his wisdom, but those who knew him best think more affectionately of his simplicity unaffected by his erudition, his humility unchanged by fame, his great kindness of heart, his patience with the dull student, his loyalty to his profession and to his friends, his disinterestedness, and the frank transparency of his character. These are the qualities which make up the Osler tradition—a tradition which will ever be a call to service in this place of his youthful studies and dreams and of his later efforts as a teacher.

Because of this gift, which we now receive and accept with gratitude and pride, this Osler tradition will, in the future, be even a greater inspiration in McGill and in Canada. His spirit has been with us; now we seem still to have a tangible part of himself. For books are the most intimate companions of a man's labour and a man's leisure. Even when friends must be temporarily banished or shut out, these silent but eloquent companions of the

printed page remain close to use, to speak to us words of knowledge or encouragement. In this Osler Library are the books his hands touched daily with affection as one touches a beloved child; here are the pages his eyes perused with eagerness in the search of knowledge or of strength; here are the gallant comrades of his hours of toil, while the heedless world rolled by; here are the companions of his moments of recreation and his brief periods of respite from labour. Surely these books are a sacred treasure, which will give daily to our students and professors a closer contact with a great spirit and will bring them, at their will, into a glorious company of immortals of whom their own great but humble fellow graduate was an honoured member. There could be no greater inspiration to Canadian youth than this splendid and sacred gift which is ours to-day.

The importance of the occasion was emphasized by the fact that appreciative messages were received by the University from Christ Church, Oxford (the College of which Osler was Student); from the Bodleian Library, which sent a beautifully printed letter; from the Osler Club of London; and from Dr. John F. Fulton, and Professor Nager, of Zurich.

And there the books stand on their shelves mute witnesses of the great spirit that has gone, and in the midst, as is fitting, the ashes of "The Chief." But one word more. The Osler Library is no mere museum of books. It is far more than that. The books have been selected for their educational value. In them we can read the entrancing story of medical endeavour and achievement; we can see the faltering steps of our predecessors on the road to knowledge; we can learn how those professing the art and science of medicine, like individuals, have risen "on stepping stones of their dead selves to higher things."

A.G.N.

THE PROBLEM OF THE MENTALLY UNFIT

THE problem of the mentally unfit has a biological, a social, a moral, and an economic aspect. The growing appreciation of this fact no doubt explains the interest that is now being taken in this most important subject, which is being discussed freely and at length in more than one country of the world. It is gratifying to know that in Great Britain, Canada and the United States the problem, difficult as it is, is being faced fairly and squarely by some medical and legal authorities as well as by mental hygienists.

Some idea of its magnitude may be ob-

tained from the Report of the Mental Deficiency Committee in Great Britain, an account of which may be obtained in the *British Medical Journal*.* It is estimated therein, for example, that there are 300,000 defectives of all ages in England and Wales, and that institutional care is required for 64,000 of these, and special residential schools for 23,000 more. When we consider what is involved in this the situation is little short of appalling. Documentary evidence exists showing that to parents, one or both of whom

*I: 775, April 27th, 1929.

were feeble-minded, were born four or more children, all of them mentally feeble or actually imbecile. That such defectives contribute a large quota to our criminal population is well known. The history of the famous Jukes family, so fully studied by Dugdale, fully bears this out. It is estimated that the defectives in England and Wales are reproducing their kind to the tune of 2,500 a year. Every country in the world, including Canada, has the same problem.

What is to be done about it? Some thirty years ago Dr. W. Duncan McKim, in his book *Heredity and Human Progress*, advocated "a gentle and painless death" for those coming under this category of mental deficiency. Public opinion, and, indeed, medical opinion, is not ready for this Spartan-like policy. There seem to be only two other remedies—segregation and sterilization. It may be said at once that the former plan is enormously expensive, and worse than this, is ineffective.

The way the matter appeals to the legal mind can be seen in a paper by Lord Riddell which was read at a meeting of the Medico-Legal Society in London on April 25th of this year. Lord Riddell stated that the policy of segregation recommended by the Board of Control would involve a capital expenditure of £29,000,000 and an annual expenditure of £16,000,000. He asked whether the community could afford to spend so much on a section of the population obviously the most undesirable. This remedy is, of course, only palliative, for it does not strike at the root of the matter. Lord Riddell said "Unless we are careful we shall be eaten out of house and home by lunatics and mental deficients." He remarked, also, that mental defectives were far more prolific than the mentally sound, and that defective parents were apt to produce defective offspring, and further commented on the large number of defectives that were convicted of serious crime. Lord Riddell argued that the existing system is "incoherent and illogical," and that its effect is to return as many lunatics and mental defectives as possible to the outside world, providing them with free opportunity to breed more lunatics and defectives every year.

Medical men, with few exceptions, will

agree that it would be better to stop the supply of defectives at the source rather than attempt to "cobble up" poor material, in the hope that it may become useful to the community. A thin veneer of educational and social accomplishments will not suffice to restrain inherent undesirable tendencies.

The alternative plan—sterilization—is that preferred by Lord Riddell. This procedure has been practised in California since 1909 on about six hundred defectives, with only three deaths, two of these being attributed to the anæsthetic employed. In one of the Swiss cantons a law has been passed requiring compulsory sterilization of those likely to produce offspring afflicted with incurable mental defects, and sterilization has been recommended by official committees of the New Zealand and Swedish legislatures. Also, a sterilization statute is now on the books in Alberta.

Any objections to the plan of sterilization are likely to be advanced under the sacred names of religion and freedom. However, we are living in a police age, and there is, in some respects, less freedom for the individual now than there ever was. Probably there are too many sumptuary laws, but there is always room for those that are well considered and are supported by public opinion. We interfere, for example, with personal freedom in matters of vaccination, quarantine, and the commission of crime. Surely, to bring into the world another individual grievously handicapped for the struggle for life, one who may in addition prove a menace to his fellows, is as much to be deprecated as murder. Nature herself copes with the situation by eliminating the unfit by the ruthless expedients of progressive degeneration and death, but while this is true of individuals, it may take many generations before a defective stock disappears and in the meantime other defective stocks are making their appearance. Unless something more is done than we are doing, we may expect, in these days of growing physical and mental stress, that the problem will become progressively more acute. This state of things is "aggravated," and we use the word designedly, by the advances made by preventive medicine, conservative surgery, and public health. We are, indeed, interfering with the normal operation of the, in

one sense, beneficent, if yet ruthless, laws of Nature, and thus, with the best intentions in the world, are ensuring the "survival of the unfit."

It must be admitted that the problem is a most difficult one. If in time we all, legal, medical, and lay, come to agree that sterilization is the best solution of the difficulty, yet it remains for us to formulate a procedure that will be at once humane and effective. Safeguards are, indeed, necessary but should not be so rigid as to defeat our main purpose.

Then, there is the question of *general unfitness*, whether mental, physical, or, as is so often the case, both. The line of demarcation between normality, so far as it relates to social adjustments and mental deficiency in its bearing on intellectual acquirement and the moral sense, is not always sharp. How far should we go? The answer is not yet, but the problem is becoming insistent and should engross our best thought and endeavour.

A.G.N.

THE HAZARD FROM X-RAY FILMS

THE appalling catastrophe at the Clinic Hospital, Cleveland, Ohio, in which one hundred and twenty-five persons were killed and upwards of one hundred more were placed in jeopardy of their lives, has called forth the sincere sympathy of all medical people and of those familiar with hospital work. Several times before accumulations of x-ray films have taken fire, but the situation has been handled without much difficulty, and the results have not been serious. The Cleveland disaster seems in some particulars to have been different. The fire and explosion came, like the proverbial "bolt from the blue," without warning; a great quantity of poisonous gases was liberated, which brought death to many of the patients, to some, the doctors and nurses at their posts, and even to the unsuspecting passer-by on the street, and the building was speedily reduced to ashes. Nothing just like it has happened before, and we may well hope that, with this lesson before us, nothing like it will ever happen again.

The first accounts of the disaster laid much stress on the presence of heavy brown fumes, which were attributed to bromine, and were regarded as the chief lethal agent. Photographic films are coated with bromide of silver, but it is quite unlikely that, in the circumstances, sufficient bromine would be liberated to cause danger. Those familiar with cellulose chemistry know, rather, that the brown fumes referred to were those of nitrogen tetroxide.

Film, as prepared for photographic purposes, falls into two general categories,—the inflammable and the non-inflammable. The

former type is prepared from nitro-cellulose and various combinations of organic substances, including camphor and synthetic camphor. When it burns, or explodes, a number of gases are liberated, among them carbon monoxide and nitric oxide. Nitric oxide has great avidity for oxygen and speedily unites with it, to form nitrogen dioxide (NO_2) and nitrogen tetroxide (N_2O_4). These nitric oxides, apart from the question of asphyxiation, are highly poisonous, for they readily enter into combination with living cells and organic matter and form picric acid. The effect on the living organism is quick and profound, as coagulation of the tissues and of the blood is a result. It is noteworthy, too, that the results of poisoning with the various nitric oxides may be delayed, and after a period of some hours, or even days, during which the affected person appears to be recovering, a fatal result may supervene. The same thing was noted during the war after explosions of nitrocellulose and after poisoning with mustard gas.

The non-inflammable films do not contain the nitrogen groups, being "acetates" and not "nitrates." They are made by treating cotton with acetic anhydride and acetic acid. While they will burn they do so but slowly, and in the process do not liberate poisonous gases.

What can be done to prevent such occurrences in the future? Much, one would think. Those who are specially interested should read the rules and precautions suggested by Hobbs in the *Journal of the American Medical Association* (92:, 1763, May 25th, 1929). Without attempting to deal with

the subject exhaustively, a few points may be referred to, which suggest their own appropriate remedies. Fire directly applied to inflammable films has been the cause of trouble. In one case the hot ashes from a cigarette were dropped into a drawer-full of film. Sparks from various electric and x-ray apparatus may also constitute a source of danger.

The system of storage is important. Attention has, of course, been paid to this phase of the question in the past, but it is not improper to suggest that in many cases the nature of the hazards to which stored film may at times be subjected has not been fully appreciated. Special rooms and special safety appliances have been provided, but are these adequate? It is obvious that if a large number of films must be stored they should be divided among separate fire-proof rooms, or, better, separate buildings. Perhaps the storage rooms would be safer if underground. Fireproof, automatically closing, doors have been provided. It is questionable how much value these have. They would, presumably, if they really work at the critical moment, prevent fire from outside getting to the interior of the storage room, but would be of no avail in cases where combustion starts within. In one recent case, where trouble in a film storage room apparently developed over a period of weeks, resulting eventually in explosion, the cause was thought to be a defective steam-pipe that entered the room leading to slow decomposition of the film. Vents, also, have been provided, with the idea in mind that in the case of fire or explosion they will carry off the fumes. Also, sprinkler systems have been installed. How far are these likely to be effective? Some time ago the Eastman Kodak Company conducted some experiments in order to elucidate the problem. They stored inflammable film in concrete storage rooms provided with vents

and a sprinkler system. It was found that, under the conditions of their experiment, the liberation of gases took place so quickly after the ignition of the film as to require a special modification of the sprinkler apparatus. Unless, in fact, the sprinkler system got to work not later than thirty seconds after the fire started it was of no use. Considering the relatively immense volume of gases liberated and the short space of time in which this liberation occurs, it may well be doubted whether the vents, as ordinarily provided, are sufficient. Closed doors, even if fireproof and automatic, would only make things worse, one would think, acting like the wadding to a gun charge.

Metal cases, securely locked, constructed to hold a relatively few films, would, however, doubtless, be of value.

But with all the precautions that may be devised and put into operation there remains the element of human fallibility. It would seem better to get right down to the root of the matter. Why not use non-inflammable film? It is objected that this is more expensive than the other. It is not likely that the increased expenditure on the film would equal the cost of providing adequate storage accommodation or of repairing the damage done by one serious fire. A second objection is that the non-inflammable film is not so delicate in its reproduction of detail as is the other. Possibly it could be improved in this particular. A third objection, that non-inflammable films are apt to curl, could certainly be surmounted. One other suggestion is that positives be printed from the film, which is then to be destroyed. Probably, these would last long enough for all practical purposes. In any case, the claims of humanity demand that a repetition of such a disaster should be rendered impossible. Expense should not enter into the question.

A.G.N.

RESEARCH BY A GENERAL PRACTITIONER

WE publish in this issue a paper by Dr. H. R. Clouston, which is of interest for more than one reason. It is the description of a deformity involving the hair and nails in a striking and characteristic manner, though not always in an equal degree. The

deformity is clearly shown to be inheritable, but only within certain limits, and these, fortunately, tend to lessen its occurrence. For example, it never jumps a generation; if a child born of defective parentage happens to escape the blemish there is no likelihood

of his posterity acquiring it, unless by a mating with another defective.

Furthermore, the disease is strictly confined to a French-Canadian stock (except where intermarriage with other races has taken place), and it is a stock which appears to have come from a part of France where cases still occur.

Dr. Clouston's paper should be consulted for the many other interesting points he brings out. One cannot but be struck with the abundance of detail which he has collected on his subject. He speaks of "unusual circumstances" giving him the opportunity to examine members of five generations—an experience which indeed does not come to many—but he has taken advantage of his experience to an extent which also is unusual. His investigations have been made in the middle of active

general practice, and that cannot be described as conducive to the making of prolonged and exhaustive inquiries of scientific merit. The difficulties it presents can only be overcome by certain qualities of mind and character. Chief amongst these is an intellectual keenness which will not be dulled by continual small distractions—"a waking eye, a prying mind." How clearly is this evident in those who have contributed to our knowledge under like conditions of work; Harvey showed it, and Jenner, and Sir James Mackenzie. These men of course were giants, but the work we are now referring to will we think be admitted to have been carried out under circumstances no less disturbing to ripe reflection, than was theirs, and with results worthy of high commendation.

H.E.M.

Editorial Comments

THE CANADIAN RED CROSS IN 1928

The annual report of the Canadian Red Cross for 1928 is before us, and affords excellent reading. It gives a simple account of good work well done. We are all too apt to take the Red Cross for granted, and, so, are not as well informed as we should be about its activities. In a general way we know that it looks after ex-soldiers, hospital visiting and relief, and comforts for soldier-settlers; that, in conjunction with the Department of Soldiers Re-establishment, it trains those ex-soldiers who are in certain ways incapacitated, so that they may take some part, at least, in the general labour market; that it is ready for emergency service in cases of serious disaster. But, there are certain other phases of its work that seem to stand out as worthy of special note and commendation.

The Red Cross in 1928 operated 44 Outpost Hospitals, in an endeavour to meet the needs of frontier districts and pioneer settlements in the matter of nursing and hospital service. These hospitals are to be found in British Columbia, Saskatchewan, Manitoba, Ontario, and New Brunswick, and are well enough equipped to meet the requirements of various Provincial Hospital Acts. Accordingly, the Governments of Manitoba and Ontario have given them special grants for maintenance. The following figures are eloquent and need no comment. Attached to these 44 hospitals,

which have 302 beds, are 82 nurses. During 1928, there were 4,367 indoor patients and 9,896 outdoor patients; there were 1,557 surgical operations. Since their establishment in 1920 no less than 66,649 patients have received treatment in these Outposts. Also, in 1928, 3,964 school children were inspected.

Another activity, of great moment, is the so-called Port Nurseries, which are located at points where immigrants enter the country. These newcomers are looked after according to their needs, are helped on their way, and an efficient "follow-up" system ensures that they will be taken in hand by representatives of the Red Cross when they reach their destinations. It is hard to overestimate the value of this, not only in a material way but in its sentimental aspect. The newcomers to our land are made to feel that they are welcome and that they need not lack the helping-hand.

Child welfare, home nursing, home hygiene, social service generally, and the distribution of health leaflets, all enlist the good offices of the Red Cross, but by no means cover the full range of its activities.

We have, then, in the Red Cross one of the most potent agencies for good in our country, a valuable ally of the medical profession and the various health agencies, an institution that deserves all the praise that we can give it and the helpful sympathy of the whole community.

A.G.N.

ADMONITIONS TO THE MEDICAL PROFESSION

The following extracts are taken from the retiring President's address to the Vancouver Medical Association this year.* The selection has been made with the idea of showing that this Association possesses a very healthy spirit of discontent, and a desire to strive for the highest aims in medicine, both of which may well be emulated by every other Association.

"It has been the custom of my predecessors in this office in the past, upon retiring, to leave with the members of this Association some product of their year of observation and experience, and as we look back, one cannot help but be impressed by the wisdom and importance of the ideals and objectives which have from time to time been proposed. But there is a factor which, in our retrospection, must be very evident and which yearly becomes to this Association more and more important and that is that few, practically none, of the suggestions or objectives that have been offered by the various retiring Presidents, have ever been acted upon. Now what does this imply? The inactivity of this Association in these matters does not in any way detract from the importance of the various proposals that have been made. To me, after a year of activity and observation as your President, it brings out very clearly what I have come to regard as the greatest handicap to this Association and to the progress of medicine in this province, the lack of co-operation and concerted action among the profession as a whole.

We have had numerous instances in the past, in what might be termed the larger affairs of medical practice in this province, in which failure of the profession to present a united front has reacted unfavourably. We are all familiar with conditions which have arisen locally during the past few years, conditions which affect this Association and at the same time affect you and me, in which the indifference or inactivity of the profession left us with our difficulties unsolved, with a diminished amount of self respect, and our so-called prestige as a learned profession more or less submerged.

But you may ask, wherein have we failed, either as an Association or as a profession? Permit me in rebuttal to ask wherein we have succeeded, and if not, why? Let us come down, for the purposes of self examination, to some of our local problems and analyze our conduct. What has been our united action for instance on the policy of vaccination, of quack healing by diet, religion and God knows what all? Can the profession calmly ignore the situation which has arisen in this city with regard to hospital accommodation? Why is it possible for any member or members of a hospital board to imply, as has been done here recently, that the medical profession has offered no acceptable proposition for the solution of existing difficulties.

It is not the province of this Association, or of the profession, to formulate policies for the direction of public utilities or civic departments, but when those

policies are inimical to the welfare of the profession and of the public then our duty is clear, and we should be prepared to go on record as medical men and as citizens in demanding that we have at least a recognized voice in seeking what we know to be in the best interests of the community." H.E.M.

THE GARTON PRIZE AND MEDAL

The British Empire Cancer Campaign, of which H. M. The King is Patron, and H. R. H. the Duke of York is President, has, through its Grand Council, instituted a valuable prize and medal with the object of promoting investigation into the nature, causes, prevention, and treatment of cancer. The prize, of which we have received particulars direct from the Campaign, is well worth winning, as it consists of a Medal and a Honorarium of £500. It should be noticed that the prize and medal are open for competition to British subjects, domiciled in the Empire at large. The Grand Council are hopeful that there will be a number of competitors from Canada. Full particulars will be found elsewhere in this *Journal*, under the heading of "News—British Empire." The subject of the essay to be submitted is "The Early Diagnosis of Cancer." As the dissertations need not be delivered to the Honorary Secretary of the British Empire Cancer Campaign until December 31st., 1931, ample time is allowed for a very full study of this important subject. There are, doubtless, many in Canada quite competent to undertake such a piece of work, and it is highly desirable, from all standpoints, that Canadian medical men should be heard from in this particular. The study of cancer, especially in the matter of prevention and early diagnosis, which means limitation of its ravages, demands the best thought of our clinical and research workers.

A.G.N.

DR. BLACKADER

We have to note with regret that while this issue of the *Journal* was in preparation, Dr. Blackader was rather seriously ill. However, it is a matter of great gratification to all of his associates and friends to know that he is now slowly improving. As we go to press we learn that convalescence has set in. Although his progress is likely to be slow, his ultimate recovery to his usual vigour seems, happily, assured.

* *Bull. of Vancouver Med. Assoc.*, June 1929.

Special Articles

The Huxley Lecture

ON

THE NATURE OF DISEASE*

DELIVERED AT THE UNIVERSITY OF BIRMINGHAM
ON FEBRUARY 12TH,

BY SIR HUMPHRY ROLLESTON, BART., K.C.B.
M.D., HON.D.SC., D.C.L., LL.D.,

*Regius Professor of Physic in the University
of Cambridge*

Health is the state of body and mind resulting from the successful adaptation of the living organism to external and internal factors. Disease (want of ease), which is a departure from this condition of equilibrium or a want of harmony, has been often defined, but the definitions have not given universal satisfaction, and, as Mercier pointed out, it is noteworthy that the fundamental concepts of other callings, such as the law, engineering, finance, and war, are also hard to define, and that this process of specification, so to speak, is not arrived at until late in their history, though their practical efficiency has not been thereby affected. Definitions are a weariness of the flesh, but it may be well to quote one out of many—that formulated by the late J. G. Adami in 1910—as it contrasts with that of health and gives a good indication of the potential variability in the reaction we call disease; it runs as follows, "Disease is a process or succession of disturbances induced by any agent which disturbs the normal activities of the organism as a whole or of its constituent parts." Into another definition—that "disease is a failure of adaptation both to conditions without the organism and within" (W. A. White)—may perhaps be read two additional points: first, that the responsible cause may be inside the body, quite independent of any extraneous factor—for example, some congenital structural defect or a functional aberration, such as "the inborn errors of metabolism" or "chemical malformations" described by Archibald Garrod; and secondly, that in the process of adaptation not only may the normal reserve power of the living body be called upon, but that in comparatively slowly developing morbid changes, such as valvular disease of the heart and narrowing of canals such as the intestine, compensatory or adaptive processes, secondary to, but keeping pace (at any

rate for a time) with the morbid change, may bring about such an adjustment that there is absolute freedom from symptoms. Thus destruction of one kidney may be compensated by hypertrophy of the other, and destruction of a portion of the liver by regeneration in the remainder. Symptoms, and disease in the sense to be explained directly, will only occur when these compensatory muscular and glandular hypertrophies fail; the hitherto latent morbid change then gives rise to functional disorder—that is, symptoms. This "margin of safety" or compensatory mechanism must be borne in mind as a difficulty in attaining the desired knowledge from the study, so much insisted upon by the late James Mackenzie, of the earliest departures from health; for by the time symptoms appear the morbid changes may be well established, and the manifestations might then be wrongly regarded as functional changes leading up to, and responsible for, the structural alterations. . .

WHAT IS A DISEASE?

To consider now in rather more detail the question, What is a disease? Primitive man is superstitious and has always regarded disease and accident as due to the action of an offended or malicious deity, of the dead, or to the machinations of an enemy, and from the last belief was derived the idea of magic and witchcraft. Disease became regarded as a definite invasion of the body, as by demoniac possession or by a more material substance, which must be allowed an exit, as by the trephining in Neolithic times, or expelled, in order to obtain a cure. This notion that the cause of disease was the presence in the body of a foreign spirit or of some concrete substance with an extracorporeal existence or phase obviously expresses, though in less scientific terms, the more modern knowledge of parasitic and bacterial infection, and so far may be regarded as prophetically rational. To discover the cause of the disease is the aim of diagnosis, and so keen is the appreciation of this important principle that there is still a tendency to regard the cause as synonymous with its results. A not unnatural outcome of the belief that disease was a disorder with an objective reality and due to some harmful substance in the patient's body was the materialization of diseases on the lines of botanical and zoological classifications, and to arrange them in genera and species after the successful plan initiated by Linnaeus. For this view Thomas Sydenham (1624-1689)—the British Hippocrates—was in part responsible. . . . Even now diseases are spoken

* Reprinted (somewhat abridged), from the *Brit. M. J.* 1: 281, Feb. 16, 1929.

of, though perhaps not seriously so visualized, as quite definite things; and it may be asked, What practical difference does it make if they are? A partial answer is that this would logically justify a rule-of-thumb practice of treating the disease rather than the sufferer. In this age of mass production and machine-made standardization, when, for example, motor cars are so alike that their disorders are of a stereotyped character, it is particularly important to insist on the obvious—namely, that human beings are made, not from one mould, but, individually, differing widely in their make-up and power of response. In illness we all desire to be treated as a special problem, not one of a crowd of Robots, and accordingly trust our medical attendants not only for their technical knowledge but also for their ability of applying it to our particular needs. Every illness is the reaction of the body and mind of the patient to some factor which in its turn may be simple or complicated; the reactions of living matter are far from constant, and those of man become more complex as he moves from childhood and the simple life of the country to maturity and the whirlpools of modern civilization. Thus a startling or offensive announcement may leave one man untouched because he is deaf; another, phlegmatic or a philosopher, may receive it in silence; whereas in a third an emotional explosion follows. This variation in the response is most dramatically seen in idiosyncrasies, such as asthma and hay fever, as the result of inhalation of horse emanations or of pollens, or of abdominal and cutaneous symptoms, as the result of eating a few specks of parsley—an example of which in four generations of a family has just been brought to my notice. . . .

But to continue consideration of the question what is meant by a disease. As long ago as 300 B.C. Erasistratus of the Alexandrian School of Medicine regarded it as a perversion of health, of the normal processes, and not a condition contrary or foreign to biological nature; but this was forgotten. In modern times Claude Bernard (1854) spoke of disease as a physiological reaction in altered circumstances, and Clifford Allbutt, since 1871, followed by C. A. Mercier and F. G. Crookshank, pleaded for clear thinking and the recognition that a disease is not a definite thing, like a plant, but a mental abstraction or concept of the reactions of a living organism in certain circumstances. The groups of reactions form distinct pictures in the mind and are labelled by the name of a disease.

WHAT A DISEASE IS NOT

Before going further it may clear the ground to consider what a disease is not; although a patient is ordinarily spoken of as, say, a case of cancer of the stomach, the malignant growth is

not the disease; for disease is the reaction of the *living* body in the form of functional disorders correlated with a cause, whereas the cancerous stomach persists after death. Disease, like health, is inseparable from life, and its nature and causation would no doubt be differently interpreted by those holding the vitalistic and the mechanistic explanations of life.* Further, gross structural change may exist, and yet, as the result of compensatory changes, not cause any disturbance of function or symptoms of disease; conversely, changes such as can at present be recognized by the naked eye and the microscope may be absent in disease, although it is reasonable to imagine that some alterations occur, just as they must in other forms of vital activity. Symptoms, though the manifestations of the reaction and so part of a disease, do not of themselves constitute a definite disease, for they may be due to several causes rather than to one. In the case of infective diseases the exciting cause is invasion of the body by micro-organisms, the toxins of which set up changes in the body and so the resulting reaction called the disease. But the manifestations of the reaction may be regarded as of two kinds and as possibly due to two mechanisms: (1) as Boycott points out, the general symptoms, such as malaise, fever, and headache, common to most infections, are mainly due to substances liberated from the injured cells of the tissues; (2) the manifestations specially characteristic, and so diagnostic of certain infective agents, may be due more to specific bacterial toxins—for example, tetanus toxin, acting directly on the body tissues; or conceivably, as Sidney Martin argued years ago, the bacteria may produce a ferment which acts on the cells of the body so that they manufacture a specific poisonous substance. *Symptoms* have in the past been regarded as diseases—for example, dropsy—and even in our own day it has become recognized that some conditions, such as epilepsy, are collections of symptoms due to different factors; hence it is more correct to speak of the epilepsies rather than of epilepsy. To collections of symptoms occurring in conjunction sufficiently often to render their correlation recognized, but without any constant single underlying cause, the names “syndrome” and “symptom-complex” have been applied; the distinction between a syndrome and a disease, as the words are usually employed, is to be found in their etiology. A distinction has also been drawn between “syndrome,” or a collection of symptoms with a functional or anatomical basis in the body, and the more modern word

* Augusta Gaskell, who argues that life is due to the permeation by an immaterial system (derived from protons and electrons) of a material atomic system composed of chemical units, believes that the phenomena of cancer “constitute a striking proof” of her hypothesis.

"symptom-complex,"† which implies a series of clinical signs and symptoms without any consideration of their relationship to a lesion or functional disorder of an organ, or a purely clinical coincidence (Cawadias). The word "symptom-complex," which has not escaped criticism as a barbaric mixture of the two classical languages, was, according to the *Oxford Dictionary*, first used in this country in 1897. As Cawadias points out, diseases were really symptom-complexes from Hippocratic times to the era of the anatomico-clinical school of Paris and of Claude Bernard and Johannes Müller (1801-58), when syndromes formed the basis of nosological classification. The term "clinical entity" is often used as synonymous with syndrome or symptom-complex to describe a definite collection of morbid manifestations which may be due to more than one distinct cause, and so is useful as long as the causation is uncertain. It thus avoids the definite statement that the group of symptoms is specific—namely, due to one factor—in other words, a disease in the proper sense of that word. Objection has been raised, especially by the late Sir Clifford Allbutt, to "clinical entity" as a descriptive title for a morbid condition, because it tends to perpetuate the material conception of something analogous to demoniac possession. But though this interpretation may be literally justified, it is not, rightly or wrongly, the meaning widely attached to the phrase.

To sum up, a disease is not a poison, a parasite, an ulcer, or a tumour, for these are causes; it is not a symptom, such as pain; but it is the mental picture of the manifest reactions of a living organism in response to harmful factors, whether derived from outside the body or arising internally.

TRANSITIONS BETWEEN HEALTH AND DISEASE

As disease is primarily a physiological reaction to stimulating or depressing factors of a harmful character, and a mental concept or "construct" summarizing the events which then occur, it is clear that the line dividing health and the defensive powers of the body from disease may be very indefinite. Thus if the defensive powers are high the necessary reaction may be so short and slight as to be unaccompanied by any symptoms, and the individual is unconscious of the inward struggle that has taken place; this process is indeed constantly in action, and constitutes the resis-

tance of a healthy individual. Truly we stand in jeopardy every hour. In other instances the reaction is more marked, but so rapidly successful that the disease is aborted; it is in cases in which the reaction is prolonged or eventually fails in its purpose that disease is more decidedly present. The leucocytosis in the early stage of infection may be compared with the reactive leucocytic increase during digestion due to absorption of food. Inflammation is an entirely useful and innocent process in the healing of an aseptic wound; indeed, it comes within the four corners of Frédéric's canon of physiology—namely, that "a living being is adjusted in such manner that each perturbing influence provokes to activity a compensating apparatus which brings about neutralization and repair of the damage." No one would call this a disease, but such an inflammatory reaction may gradually become a disease; thus local peritonitis producing adhesions by shutting off an infective focus is a protective or curative process; but general peritonitis is a reaction which so often fails that the causal infection is fatal. Here it may perhaps be mentioned that somewhat similar transitions are seen in diseases which vary in the number of the symptoms; when, instead of all the symptoms recognized as making up the mental concept, a few only are present, the disease is spoken of as larval or "fruste"; this may be a question of time, the reaction terminating before the initial manifestations are supplemented by those necessary to complete the recognized clinical picture.

With regard to the nature of the exact vital changes which occur in disease, apart from the comparatively gross alterations revealed by the microscope, there is much to learn. The recent advances of knowledge in connection with the constitution of the atom and the electron hold out promises of possibilities the extent of which it is difficult to forecast. The application of physical chemistry to medicine is clearly of the greatest importance, but is so beset with difficulties that attempts to do so deserve sympathetic encouragement, even though they may not as yet carry conviction or be confirmed.

EVOLUTION OF DISEASES

As diseases cannot, strictly speaking, be regarded as definite "things," it might seem illogical to speak of their evolution, and it has recently been stated that a serious attempt has not yet been made to apply the doctrine of evolution to the natural history of disease (Gill). No one, however, can fail to be interested in the changes that diseases have shown in the course of time, and in the forms that appear to be new and produced in certain circumstances; as long ago as 1890 an interesting work on *Evolution and Disease* by Sir John Bland-Sutton appeared. Some sort of an explanation of the existence of

† Mercier in 1917 poured scorn on "the terms syndrome, symptom-complex, and other monstrosities made in Germany" as "on a par with the exploit of the servant girl who calls a brilliant flash of lightning 'chronic' or the alienist who calls primary dementia 'dementia praecox'." But the word (συμδρομή) was employed by the Empiric School of Alexandria, 300 B.C., to describe a series of symptoms (Crookshank, Cawadias), and was adopted by Galen.

disease may perhaps be suggested, as a side issue after reading Professor A. E. Boycott's recent presidential address to the Section of Pathology of the Royal Society of Medicine; in it the capacity of self-repair is emphasized as one of the main characters of living organisms, but it is pointed out that this faculty is not, or only in a very slight degree, possessed by individual unicellular organisms. Now little or nothing, if the problematic nature of bacteriophage be excluded, is known about the diseases of unicellular organisms. Diseases and the power of self-repair have both become recognizable as the scale of animal life is traced upwards, and it is conceivable that they are closely allied forms of reaction to stimuli—the one (self-repair) successful, the other (diseases) more or less ineffective. *Diseases are not rigid types, but the more or less unsuccessful reactions to harmful factors, most commonly environmental*; it follows, therefore, that they show considerable variations in their manifestations, especially as the reaction depends on two variable factors—the characters of (1) the host or the “soil,” and (2) the unfavourable environmental factor, the “seed.”

CHANGES ASSOCIATED WITH CIVILIZATION

1. In the course of his progress from primitive to civilized life man has undergone many changes, and his bodily reactions to external factors, and therefore his diseases, must, like the forms of his virtues and vices, have altered in a corresponding degree, for consideration of his surroundings would suggest that the further man moves from his savage state the more complex will the character of his disorders become. How much a change of type of disease has occurred it is difficult accurately to estimate, for the slow advances of medical knowledge might easily make it appear that the evolution of disease has been more recent and extensive than is really true.

As both nations and their constituent individuals differ in their “constitution” or make-up, partly from heredity and partly from the result of the long-continued influence of their surroundings, their powers of resistance to disease must vary in a corresponding degree. Under certain conditions, such as those of war, famine, and epidemics—for example, of influenza—the vitality of a nation may be so much impaired that factors ordinarily comparatively harmless are enabled to act at an advantage, so that other diseases become frequent. Thus secondary epidemics or diseases which are not in evidence at other times may become prevalent. This sequence may have suggested to Sydenham his conception of “epidemic constitutions”—that is, that during the period of a dominant epidemic other diseases tend to share the characters of that infection. There are, indeed, close analogies between the factors modifying

diseases in the course of time and those which appear to be responsible for the outbreaks of epidemics. The diminished resistance of a nation due to the depressing factors—material and mental—inherent in war, destitution, and unemployment, would probably allow micro-organisms previously of comparatively low pathogenic power to become active, and thus help to explain the increased frequency of streptococcal diseases, especially subacute and chronic bacterial endocarditis, and of pernicious anaemia since the great war.

Hereditary deficiency in resistance of the tissues, or of one particular tissue, of races or of individuals may lead to the incidence of particular diseases or to certain forms of those diseases; so that a nervous system weak from congenital defects will favour the attack of an infection, such as that of influenza, on that part of the body—a problem recently discussed by H. P. Newsholme. Hereditary diatheses or morbid proclivities in certain races of mankind lead to the occurrence of special diseases among them; this is best seen in the Jewish nation, which provides most of the cases of amaurotic family idiocy and thrombo-angiitis obliterans.

INFLUENCE OF ENVIRONMENT

2. Environment influences disease in many ways. It is so clear that climate is a most potent factor that the effects of heat and cold, humidity, absence of sunlight, need not be laboured: in hot countries the presence of special parasites, particularly protozoa, such as the malarial and amœbic organisms, and their carriers or vectors, such as mosquitos, are responsible for the important group of the tropical diseases. On the other hand, an environment, such as that of isolated races, free from some common infections, such as tuberculosis and measles, leaves the inhabitants a virgin soil; but should the infections be introduced, the incidence and mortality of the diseases tend to be very high. This is not so much due to want of innate racial resistance, as might perhaps be thought, but to the widespread absence of any previous individual infection and acquired immunity, or, as Krause persuasively argues, to concomitant changes in the manner of life, approaching those of the more artificial complexities of civilization which lead to physical degeneration of the pure stock of primitive peoples.

Environmental factors are more obviously powerful than heredity in the production of new forms of disease; this was shown, particularly during the great war, by occupational diseases in which the worker is exposed to some poisonous agent, such as trinitrotoluene or tetrachlorethane, in the manufacture of munitions and the varnishing of aeroplane wings with “dope.” . . . Another way in

which environment brings about disease is by privation of some essential accessory food factor. Study of the "deficiency diseases" and the discovery of vitamins have opened out the path to the prevention of diseases such as rickets, beri-beri, scurvy, and dental caries; and recently vitamin E has been shown to be essential to fertility, its absence being responsible for sterility.

Among the environmental factors bacteria and protozoa are responsible for the majority of diseases. As they are at the base of the scale of living organisms it may be assumed that they are more prone than the higher animals and man to variation and mutation as the result of influences such as food and temperature; and that, at first purely saprophytic, some of them in course of time become parasitic and pathogenic for man.

Differences in the clinical manifestations of enteric (typhoid and paratyphoid) fever, dysentery, cerebro-spinal fever, and to some extent of pneumonia, have been proved by bacteriology to result from infection with different types of the typhoid-paratyphoid group, dysentery bacilli (Shiga and Flexner), meningococci, and pneumococci. This distinction of the type of the infective organism is, of course, of far more than academic interest, for it enables immunological treatment to be scientifically and successfully employed. Further evolution of bacterial variations, such as at some time in the past may have resulted in the formation of paratyphoid from typhoid bacilli, might lead to the production of new forms of disease; at the present time it may well be that there are many such bacterial divisions of disease as yet not separated from each other clinically and so still included under a single nosological label. Aberrant forms of infectious diseases would suggest the existence of variations in the causal agent; but here the possibility that mixed infections play a complicating part must be borne in mind. Just as diseases may die out, such as "the sweating sickness" in England in the fifteenth century, so many new diseases arise; syphilis, it seems safe to assume, did not exist in ancient Rome, as such a careful observer as Galen did not describe it or its nervous manifestations tabes dorsalis and general paralysis of the insane. . . . Among animals hog cholera, unknown before the seventies of the last century, when it appeared in the United States of North America, is an example in support of the view that micro-organisms can and do undergo evolution from a harmless saprophytic condition to one of pathogenic activity. . . .

THE SIGNIFICANCE OF DISEASE

To most minds disease is included in the mystery of evil and considered an unmitigated calamity, and in the past has been regarded as

part of a system of rewards and punishments. As the existence of a single unicellular organism normally terminates by division into two similar but rejuvenated individuals, these simple cells have been described as immortal, whereas in the higher grades of living creatures death has been regarded as an acquired character, associated with differentiation of the constituent cells and a resulting highly complex mechanism, and as an adaptation advantageous to the race (Weismann); this last—academic—conclusion has been criticized as probably the most perverse extension ever made of the theory of natural selection (Pearl). Death comes either naturally by a gradual exhaustion of the innate endurance and vigour, or unnaturally from accident or disease, which are therefore short cuts to death. From a biological point of view diseases have been regarded as beneficial inasmuch as they weed out the physical weaklings and so make for the survival of the fittest and the improvement of the race. . . . It is unnecessary to labour the evils brought by disease, but it may be well to glance at the other side of the shield and, though to some this may at first sight seem fanciful, to explore the possibility that disease may have good effects—a contention vigorously supported from a technical standpoint nearly a quarter of a century ago by the late Frederick Treves.

As good may come out of evil, it may be worth while to summarize briefly the conceivable ways in which disease, on account of associated conditions and of the opposing forces thus brought into play, may be regarded as exerting a beneficial effect. This problem may be reviewed from two aspects: (1) general and sociological, and (2) that of the individual.

BENEFICIAL EFFECTS OF DISEASE IN GENERAL

It is not always easy or indeed possible to draw a hard-and-fast line between the normal or healthy on the one hand, and the abnormal, which may tend to produce disease or be in itself morbid, on the other hand. There may, in fact, be innocent as well as malignant abnormalities. There is a borderland between health, which Allbutt (1924) spoke of as an oscillation about an ideal axis, and disease, and it has been said that they are both relative terms and that there are various states of health and of disease (W. A. White).

The racial characteristics which, according to Keith, in part depend on the degree of activity of the endocrine glands, may, when exaggerated, become definitely morbid and cause disability. Thus in this country the condition of Mongolian idiocy, first described in 1866 by Langdon Down, the causation of which, though uncertain, may possibly be due to a disturbance of the endocrine balance (Clark, indeed, ascribes it to foetal exophthalmic goitre), re-

produces some of the facial characters of the Mongolian race. . . . The occurrence of variations or, more strictly, of "sports" plays a part in the evolution of the race, and among these departures from the average the line of demarcation may be very thin between those exerting a beneficial influence and those definitely morbid. This is familiar in Dryden's lines:

"Great wits are sure to madness near allied,
And thin partitions do their bounds divide,"

and as regards this particular example it has been shown by the late Sir Frederick Mott and others, from a study of many pedigrees, how real this association is, and that environment and factors so obscure that in our ignorance they are called chance determine whether this inborn tendency will land the individual in the seats of the mighty, a prison, or a mental hospital.

The variations that are responsible for the evolution of the race are accompanied by others that facilitate disease, and though the latter cannot of themselves be regarded as useful, their occurrence is so commonly associated with that of those making for improvement that they may be regarded as a necessary accompaniment.

Genius and outstanding ability, though often and easily confused, are distinct; ability is, as Galton showed sixty years ago, largely hereditary, and may be associated with a family history of mental instability or defect. But, as compared with ability, genius is a finer and extreme development of the imagination and power of correlation, and may extend out of the abnormal into the pathological. The association of genius with disease of the mind and body has no doubt been exaggerated by the statement that a genius is hardly ever healthy; there are, however, abundant examples to support the contention of Lombroso and others that genius is often closely related not only with criminality and insanity but with other morbid conditions of the nervous system; this combination may occur in the same person, or the association may be shown by evidence of the neuropathic element in the genius's family tree. In the latter instance the genius or specially gifted individual comes of a neuropathic stock, though not himself necessarily degenerate. Enough has been said to show that genius and mental instability may be regarded as variations from the normal mentality. Their morbid manifestations may occur at different times in the same person, periods of definite insanity supervening and passing off; or insanity when it supervenes may close the career.

Geniuses, being usually highly strung, are certainly not immune to common ailments. While disease damages and eventually may destroy the body of the gifted individual, it must colour the mental attitude during the

progress. While the usual effect of poisons is necessarily deleterious, some of them, especially in the highly sensitive and those with an idiosyncrasy, may in the early stages, when their irritant effect is predominant, exert a stimulating effect. Alcohol, opium, and morphine, as shown by not a few examples, have been the means by which a genius has been helped to deliver his inspired message. Similarly it has been thought that the toxins of disease may so act on the brain as to lead to the production of masterpieces instead of the more frequent nightmares and delirium. Many literary giants have naturally been tuberculous, and it is an obvious suggestion that their eminence may, in greater or less degree, have been due to, rather than in spite of, their infection. It has also been thought that syphilitic toxæmia played a part in the increased output of brilliant work shortly before its destructive triumph over men like Guy de Maupassant, Friedrich Nietzsche, Heinrich Heine, C. P. Baudelaire, and Paul Verlaine. The occurrence in Nietzsche's *Ecce Homo* of chapters headed "Why I am so clever" and "Why do I write such good books?" certainly suggests that he was already in the stage of exaltation of general paralysis of the insane.

It has been argued that, like alcohol and morphine, the bacterial poisons are responsible for striking ideas and conceptions by paralysing the mechanism normally blocking the external manifestations of an underlying creative power or personality (Jacobson). It is tempting to speculate on the correlation of various organic diseases with the characters of the literary and artistic products of the sufferers, and how far any special trait or tone of expression can be regarded as related to a particular disease. Did the hopeful spirit—the *spes phthisica*—account for the inspiration of some victims of pulmonary tuberculosis, such as Keats, Laurence Sterne, Emily Brontë, and Elizabeth Barrett Browning? There is some evidence from the *Vailima Letters* that when Robert Louis Stevenson's health improved his literary work deteriorated, and this has been explained by the absence of a toxæmic influence. In other instances, such as Francis Thompson (1859-1907), author of *The Hound of Heaven*, and Thomas De Quincey, tuberculosis of the lungs has been complicated by alcoholism or opium addiction; and then, as Jeannette Marks says, the question arises of "germs and genius" or "drugs and genius." How far did dyspepsia or, as G. M. Gould insisted, eye-strain, guide Thomas Carlyle's mordant pen, and to what extent was Ménière's syndrome, from which Jonathan Swift probably suffered, responsible for his savage wit?

In some rather special instances an individual's disease has been the means of greatly

benefiting his fellow sufferers, as it has made him monstrous kind in the practical sense of providing for their well-being and care; thus Sir Arthur Pearson's (1866-1921) loss of sight was the salvation of the blind in St. Dunstan's, where they were taught not only to earn their living but to bear their cross courageously and cheerfully. Medical men, themselves stricken, have worked for the relief of those with whom they can so fully sympathize: E. L. Trudeau (1848-1918) utilized his own long fight against tuberculosis to promote the open-air treatment of that disease in North America; and it has been said of him that perhaps nothing in the whole field of medicine in the past fifty years in America has done so much directly or indirectly to relieve suffering and extend the years of usefulness of so many people as the principle which Trudeau laid down at Saranac Lake (J. A. Myers). Another example is Mr. Clifford Beers, who, having suffered for years from a severe psychosis, founded the National Committee for Mental Hygiene in the United States.

In his pathetically charming *Confessio Medici* the late Stephen Paget (1855-1926), who suffered much and greatly loved his fellow men, wrote, "You cannot be a perfect doctor till you have been a patient; you cannot be a perfect surgeon till you have enjoyed" (and he proceeds to justify the somewhat unexpected verb) "in your own person some surgical experience." Many examples could be given of medical men who, as the result of their own sufferings, have been able to throw light on the nature, prevention, and cure or alleviation of their own particular cross.

Pain, one of the commonest manifestations of disease and useful as a warning of its presence, may, as James Hinton (1822-1875) the mystic argued, have uses that we know not of, possibly an unconscious though effective martyrdom for others. In his *Book of the Sorrowful* Hinton was mainly concerned with mental anguish, but with regard to physical pain it may also be wise to admit that there are more things than are dreamt of in our philosophy. Professor Emery Barnes reminds us that "from St. Paul downwards through the ages some of the greatest Saints of God have believed that their bodily sufferings or their bodily weakness has been of immense value in training the spirit."

Lastly, disease, which usually exerts an evil influence on the history of nations, may protect one of two hostile armies from the other by rendering advance and successful invasion impracticable, or open the way to occupation of a new land—for example, the "providential" pestilence among the aborigines of Massachusetts Bay (1616-20) which enabled the first Pilgrim Fathers to take possession of the land in safety (Krause).

BENEFICIAL EFFECTS FOR THE INDIVIDUAL

A disease may do good by limiting its victim's activities in certain directions, such as social success or athletic prowess, and so leading him to concentrate his energy and powers on some specialized branch of intellectual work; thus by way of compensation he makes good, or achieves even greater success than he would have thought of attempting when unrestricted in his choice of a life's work. Invalidism necessarily restricts vicious self-indulgence and excess in satisfying the lusts of the flesh, and so may protect against the risk of other diseases to which the vigorous are, as a result of their rude health, more prone to expose themselves. This mode of protection is analogous to that probably responsible for the great longevity of women as compared with men.

There are other ways in which disease is a blessing, though perhaps in disguise; the onset of a trivial ailment or the detection of the early signs of disease without symptoms, such as are discovered at a routine examination for life assurance, may so impress the individual that he amends his manner of life, greatly to his future advantage. This warning mechanism was well expressed in the title of Sir William Osler's paper on "The advantages of a trace of albumin and a few tube casts in the urine of certain men above 50 years of age." Another example is the advantage of a raised blood pressure detected in its initial stages, provided steps are duly taken to prevent a further rise which would in time lead to generalized arterio-sclerosis and perhaps granular (arterio-sclerotic) kidneys. . . .

An acute disease may cure a chronic affection; thus pneumonia may, for the time being at any rate, abolish the movements of chorea, or remove a skin disease of long standing; whooping-cough has long been thought to be relieved by vaccination, and has been known to be benefited by an attack of urticaria (Bury). The influence of an acute infection on a chronic one is probably analogous to the effect of protein shock therapy, in which the injection of a "foreign" protein into the blood stream sets up an acute reaction which in some way increases the protective mechanism against infection; for example, injection of peptone may be followed by much improvement in chronic arthritis. Just as many acute fevers leave behind them immunity for the rest of life, so a modified form of the disease or an abortive attack, which may escape notice at the time, protects the individual from a recurrence of the disease. This is well shown in vaccination against small-pox, and by the observation that people who have had the present mild form of small-pox, sometimes called alastrim and para-small-pox, do not contract the disease itself. Many forms of treatment act by stimulating or supplying the reaction and defensive powers of the patient necessary to repair damage or overcome infection; this was the rationale of Almroth

Wright's vaccine therapy, and empirically the method has been employed for ages. . . .

THE RELATION OF THE NATURE OF DISEASE TO ITS PREVENTION

Lastly, with regard to the practical bearing of the nature of disease; the ideal of Medicine is the prevention of disease, curative treatment being really a tacit admission of failure in this respect. For the prevention of disease knowledge of its causation and nature is obviously essential. The two great factors in the causation of disease are heredity and environment. Heredity of actual infective disease occurs in only a few instances; but structural and functional defects, especially in the vital resistance, of the body are common and important. Environmental influences cover a wide field, from the gross factors of deficient food, slum dwellings, and general misery, to the ultramicroscopic viruses of infective disease. The preventive measures and remedies, therefore, are correspondingly various. It is unnecessary to refer to the desirability of correcting the economic factors of poverty resulting in unhygienic surroundings, overcrowding, and deficient and bad food and drink; but a word may be said about the importance of universal health education as a means of preventing disease and so preserving the well-being of the nation. The recognition of the need for intellectual education is a duty recognized much earlier by the Government, for it is only since the war, when the Ministry of Health was established, that health education of the masses has really gone ahead. Preventive medicine is every man's business, for it is the active response to the instinct of self-preservation. . . .

About the fundamental subject of an accurate knowledge of the causation of disease, on which preventive medicine is based, there is yet much to learn. As Sir George Newman has pointed out, it is extraordinary what contributions to medicine have in the past been made by scientific men who were not members of the medical profession. The debt of medicine to the more exact sciences mounts up much more rapidly and is much more in evidence now than ever before, and it is obvious that there should therefore be the closest possible association and correlation between the scientific workers in laboratories, where discoveries are made and tested, and the clinicians in the wards of hospitals, where the practical application of new knowledge may lead to fresh advances in the prevention as well as the cure of disease. With the specialization inevitable from the enormous advance of knowledge there is an unfortunate tendency for these two classes of workers to plough their own furrows; guidance from men of pure science is of the greatest value in the discovery of the causes and nature of disease; for physics and chemistry, biochemistry, physiology, and pathology touch, overlap, and interlace with each other, and human biology is a good synonym for medicine. To facilitate this desired association much can be done by the plan of having the various science laboratories in the same building or all concentrated together; the physiological, biochemical, anatomical, and pathological departments close to and communicating with the hospital, just as the physics department is or should be a near neighbour of the engineering laboratory. The University should have control of the hospital as well as of the laboratories—a conception not perhaps yet widely accepted.

Men and Books

"DOCTOR JAMES BARRY"

BY RIDLEY MACKENZIE, M.D.

Montreal

Much interest has lately been aroused in England in the masquerading of women as men, by the case of Mrs. Smith. This woman posed for many years as "Colonel Barker." She is at the time of writing undergoing trial for perjury in taking out a licence when she "married" one of her own sex. As a result of this public interest the *Illustrated London News*, of March 16th, devoted a page to the amazing male impersonation of "Doctor James Barry," who acted as surgeon to a British regiment in many parts of the world. There may be some who can recall a time when she was stationed here with the Montreal garrison, in the late fifties.

She is said to have qualified at Edinburgh at

the age of fifteen, and to have passed to a full surgeoncy on the staff, ultimately becoming Inspector-General of Hospitals. She died in England at the age of eighty, after retiring on a pension. The condoning of her many serious breaches of discipline led to the surmise that she had great influence at headquarters. This, and the fact that she was always well supplied with money, have aroused various speculations as to her origin. The most romantic of these describes her as the illegitimate daughter of the Prince Regent. It is more probable, however, that she was the grand-daughter of a Scottish earl, and adopted the medical profession from an attachment to an army surgeon who had died.

There cannot be many alive in Montreal who remember her. The late Dr. Robert Craik told the writer he remembered seeing her, and one of the social leaders of the period amused and interested the writer with tales about her. Sir Wm.

Osler in *Bibliotheca Osleriana*, 5394, states Barry occupied a house, while stationed in Montreal, at the north-west corner of Sherbrooke and Durocher Streets, which has since disappeared. Dean Campbell of the Medical Faculty knew her well and attended her professionally without any suspicion of her sex. She was a strict vegetarian, and on accepting an invitation to dine sent the menu to be prepared for her. It often included the Quebec turnip, a vegetable for which she had a great liking. She invariably attached herself to the best looking woman at the gathering, naturally causing much annoyance to the men present. She was of a quarrelsome nature, and was engaged in two challenges, one of which she accepted without serious consequences. The other she declined, although she herself had provoked the quarrel, with subsequent loss of prestige and expulsion from the mess. Her excessive vanity was shown in the rich turn-out she drove in winter. Her sleigh was one of the finest in Montreal, and was decked with beautiful musk-ox robes. Her coachman and footman were the tallest men she could procure, and were always dressed in bearskin hats and capes. It was said that they revenged themselves for her rough treatment of them by driving at full speed through the "cahous," deaf to her cries, and she was usually found at the bottom of the sleigh, bruised and buried in her robes.

She took many precautions to conceal her sex, a deception which was successful until her death. To add to her height she wore heels two inches high, and an inner sole three inches thick. To disguise her figure she wrapped towels around her body. Her valet gave the number as six, but nevertheless asserted that he was ignorant of her sex. At the age of forty she was described as being youthful in appearance, with reddish hair, high cheek bones, and a shrill voice.

She died in 1865, and then her sex was discovered, in spite of provisions in her will designed to prevent this. The Registrar-General ordered an autopsy which established the fact that she was a woman, and that at one time she had borne a child. A military funeral which had previously been arranged was countermanded. This circumstance will strike a modern reader as decidedly unfair. There can be no doubt of her courage or of her medical skill. Lord Charles Somerset, whose personal medical attendant she was, described her as "the most skilful of physicians, but the most wayward of men." The fact of a woman practising medicine no longer appears incongruous. On the other hand, she was eccentric and unattractive in character, and her whole life was built upon a lie.

Like many more worthy figures of the past, her memory and her grave in Kensal Green Cemetery were alike neglected. The Baroness de Wagstaffe and Miss Jessica Grave undertook to restore her last resting-place, and the late Sir William Osler promised to assist them. The writer is unaware whether this project was

actually carried out, or not. In any case, it is to be hoped that the memory of one who, while denying her sex, was yet a pioneer in what is perhaps its highest sphere of endeavour will not be entirely lost in a city where she once practised and drove out to dine.

THE DRAMA OF NAPOLEON III.

At the Royal Society of Medicine on Wednesday, March 20th, Dr. Leonard Williams told the story, with profuse illustrations on the screen, of the most dramatic figure of the nineteenth century, Charles Louis Napoleon Bonaparte, for four years President of the French Republic, which followed upon the fall of Louis Philippe, and from 1851, until the disastrous Franco-German War, Emperor of the French. The career of the Emperor as set forth by Dr. Williams amply proved the description given of him as an arch-conspirator, but the lecturer's main object was to show that the story possessed great medical interest. This also the disquisition proved, and we must assume that Dr. Williams was well documented before he definitely laid to the charge of pathological developments so great a share in the disastrous finish of the imperial adventurer's life. The early events of this life were told by Dr. Williams with deliberate brevity and a choice of caustic language that contrasted excellently with the grand, and often grandiose aspirations of Louis Napoleon; in a few sentences he covered the interval of intrigue and pleasure which is supposed to have suggested to Eugene Sue the character of Rodolphe; but he related the sensational story of the escape from Ham as such a story should be told, that is with gesture and with relish of the situations that were being depicted, and closed this part of his address with a description of the daring intriguer seated on the throne of France by what looked like popular acclaim, and married romantically to one of the most beautiful women in Europe. At this stage pathology enters and Dr. Williams described, in a way that was all the more terrible because simple words were used and flippant comments were interspersed, how the miseries arising from a vesical calculus helped to ruin the usurper's prestige in France, to alienate the affections of a profoundly ambitious spouse, to warp his judgment in the conduct of international affairs, finally to leave him the victim of unescapable tragedies. On the last passage in the life of Napoleon III., when as a sick and elderly man he sought refuge in England, Dr. Williams gave information that was probably new to his audience, and many, like ourselves, will wonder where support can be found for a daring surmise which would account for the closing scene of Louis Napoleon's life. The details of that scene are historical and were given in *The Lancet* at the time¹. The Emperor was submitted a few days before his death to two belated attempts to relieve him by lithotripsy of a calculus whose presence could be easily

associated with sufferings that he had endured for many years, and on the morning of the day when for the third time operative interference had been planned, he died before Sir Henry Thompson had commenced to operate. The account of the autopsy, signed by all the Emperor's advisers except Sir William Gull, was published in our columns, as was Sir William's minority report, and the documents were the subject of considerable comment from the medical point of view in many quarters, for they revealed circumstances which would usually be considered to constitute a bar against operative interference. It was not here that Dr. Williams did more than summarise contemporary documents; the sensational part of his address was to come when he suggested that the operations were undertaken at the Emperor's order. Louis Napoleon must have been told by Sir Henry Thompson, said Dr. Williams, out of Thompson's vast experience that the operative interference possible at that date would be extremely dangerous, but none the less the Emperor himself insisted. Why? asked Dr. Williams, replying, "Because Louis Napoleon was resolved to make an attempt to regain the French crown. He intended to make an Elba-like return in emulation of Napoleon I., and felt that such return could only be successfully staged if

he rode with the troops."—*The Lancet*, 1: 675, March 30, 1929.

A TRIBUTE TO HARVEY CUSHING

A hundred friends gathered in the laboratory of surgical research of Harvard University Medical School, April 8, to pay their respects to Dr. Harvey Cushing and to present a copy of the April number of the *Archives of Surgery*, which was dedicated to him on the occasion of his sixtieth birthday. The volume is unusually large and all of the papers were contributed by his pupils. Dr. Cushing was deeply moved. He recalled the pleasant associations with his many pupils in the last thirty years. Humour was added to the occasion, the *New England Journal of Medicine* says, by the reading of a poem, "The Tie That Binds," and the presentation of an "unusually gorgeous necktie." Tea was served. Dr. Cushing's family, members of the staff of the school and of the Peter Bent Brigham Hospital, Drs. Elliott C. Cutler, Cleveland, Kenneth G. McKenzie, Toronto, Ont., Emil Goetsch, Brooklyn, and Samuel C. Harvey, New Haven, were among those present.—*J. Am M. Ass.*, 92: 1529, May 4, 1929.

Hospital Service Department Notes

THE RADIO AS A VALUABLE THERAPEUTIC AGENT

It is becoming more and more accepted that the mental condition of the patient is almost of as much importance as his physical condition and any agent which will tend to improve his mental condition must not be disregarded unless it is an entirely impractical one.

Many hospitals are installing radio equipment but it is, as yet, an almost unknown quantity as far as its workability is concerned. Unlike the hospital library, there are many difficulties in the way of radio installation in hospitals. There are many mechanical difficulties in the installing of a central radio set, which centralized plan seems to be the accepted one, that must be considered and overcome. The manner of wiring, keeping in mind that interference from other electrical services must be reduced to a minimum, is a difficult problem. Also interference from electrical motors, operating elevators, office machines, telephone switchboards, etc., is frequently encountered and must be overcome.

It would seem that a centralized plan of furnishing radio facilities to the patients might well be provided in all new buildings. One aerial well placed, both from a reception point of view and so that it will not be unsightly,

can take care of the entire institution. A central receiving set placed in the office, probably near the telephone desk, can be controlled by office clerks and telephone operators. Wires can be run from the central set in conduit to each bedside and earphones supplied to each patient. In one hospital, the ear sets are rented to the patient at a nominal fee and this slight revenue assists in the radio upkeep.

The new wing at the Sarnia General Hospital, under construction at a cost of \$135,000, will be radio-equipped throughout. There will be a central receiving set and head-phones for each bed. Other hospitals throughout Canada are also experimenting along this line and more information regarding results will be available at a later date.

The radio certainly holds a most important place in the every-day life of most families and when patients come from their home to the hospital they miss this feature of their home life. Hospitals are changing with the years and more thought is being given to beauty, cheer, and mental recreation. The radio, then, is just one more agent which may be utilized not only in brightening the hours which must be spent in the hospital but in cheering the patient on to ultimate recovery.—*The Canadian Hospital*, April 1929.

PAYMENT FOR MOTOR ACCIDENTS

The twentieth century has received many sobriquets and that of the "Motor Age" may be as fitting as any. Like the rose with its thorns, this mechanical era has been accompanied by various difficulties and maladjustments which have not yet been fully corrected. Among these has been that of payment for the doctor and the hospital in motor accident cases.

It is easy to understand the reluctance, to put it mildly, of the patient or motorist to assume responsibility for these accounts. But that does not help the doctor nor the hospital. As Mr. R. H. Cameron remarked in his Presidential address to the Ontario Hospital Association, "In a majority of these cases the hospitals find it almost impossible to collect for their services. I have in mind a typical case, that of a young girl admitted to a local hospital over a year ago. She was severely injured in such an accident, and required a long period of care and treatment. The cost of maintenance to the hospital was several hundreds of dollars, but not a penny of this amount has been forthcoming. The injured parties say, 'Collect from the owner of the car.' The owner says, 'It is not my fault.' The Relief Officer will not accept responsibility for persons so injured. It is the hospital that pays the bill for speeding and careless driving. Is this fair? It is not! The man who drives or owns a car is, presumably, not a proper candidate for charity. Common humanity demands that those suffering accidents be treated, but it is not right that the hospitals should bear this heavy burden."

If, after more or less prolonged litigation, irritation, and endless subpoenas for evidence, the case is settled definitely, payment is made, as a rule, in the following order: lawyers, garage, damages, nurses, hospital, doctors. Frequently, available funds are exhausted after the first two items have been adjusted. All too frequently the party responsible for the accident has no tangible assets, is not insured, and cannot meet his obligations.

The situation becomes annually more acute. Last year, in Ontario alone, four hundred and twenty-two persons were killed, and three thousand nine hundred and seventy-six injured by motor cars. In the United States, more than eight hundred thousand people were injured and thirty thousand killed. The Metropolitan Life Insurance Company reports that, during August, 1928, 22.8 persons per 100,000 lives exposed were killed by automobiles, and, in September, 19.8 persons out of each 100,000 exposures lost their lives. Motor traffic is becoming denser each year and our network of improved highways is bringing this problem to practically every hospital in the country. A

large and increasing proportion of automobile owners have very limited means, and one hospital superintendent reports that about 80 per cent of the accidents admitted to his hospital happened to people who are practically without funds. Such a situation spells one more reason why hospital costs are high.

THE REMEDY

What can be done about it? Some hospitals insist, in self-defense, that the victim or the person bringing in the patient agree to be held responsible, but such bargaining, while the patient lies under the sword of Damocles, is neither humane nor in keeping with the charitable ideals of our hospitals.

The solution of this problem seems to lie in some form of *compulsory liability insurance*. On this point, staff surgeons and hospital administrators appear to be agreed. Dr. H. W. Lewis, of the City Hospital, Saskatoon, states that "compulsory insurance for all car operators seems to be the solution." Of course, there would still be lawsuits and delays; the parties concerned might protest that hospital treatment was undertaken without their consent; in many cases responsibility might not be fixed; and vigilance would have to be exercised lest the hospital service clauses be omitted from the law, as occurred in one State across the border. But, at least, where responsibility could be fixed, a properly worded law would ensure payment for services rendered. To quote Mr. Cameron again, "I would suggest that the Legislative Committee of the Association (O.H.A.) should formulate and present to the Government a request for legislation which will provide that, when a plaintiff has been awarded damages in an action arising from an accident, the claim or account of the hospital and surgeon should be a lien upon the amount granted in the verdict. The amount of damages is usually arrived at by the judge, taking into consideration the expenses of the surgical and hospital treatment, loss of time, pain and suffering. The first of these is the most important and is frequently the only one that is not paid."

To lessen litigation and delay and to minimize the difficulties mentioned above, a very valuable suggestion has been made in *The Modern Hospital*, by the superintendent of St. Barnabas Hospital, Newark. Bearing in mind the success of the various Compensation Boards, he suggests that these cases be taken out of the hands of the courts and be considered by a commission set up by the government. The referees would not only hear the cases but would direct the disposition of the money paid in under a compulsory insurance scheme. Such a plan would ensure justice to all without heavy legal expense and the money would be paid to the commission for disbursement, in-

stead of being turned over to the successful appellant's lawyer. Various difficulties might come to mind, but the idea is worthy of consideration. Undoubtedly some form of protection for surgeons and hospitals is long overdue.

USE OF CONSENT OR RELEASE FORMS ADVISABLE

Several hospitals in different parts of Canada have written to this Department for information about *Release or Consent Forms*. While such forms have been used routinely by many hospitals for years, there are still a large number of institutions where no protective procedure is followed. So many hospitals and their staffs have been threatened with suit by "gold-digging" patients with fancied wrongs that some form of protection is highly advisable. The minds of some individuals turn to legal redress like that of the duck to water and they seem only too willing to follow the direction of some discounted legal adviser. Accordingly, it has been suggested that we reproduce a few representative release or consent forms, as used in some of our leading Canadian hospitals.

CONSENT FOR OPERATION

Several lawsuits are on record which have arisen from a misunderstanding as to the extent of the operation or whether the anesthetic was to be for diagnosis alone without incision or removal of tissue. Verbal consent has been revoked on the witness stand. The tendency of to-day is to interpret the letter rather than the spirit of the law. Not only is it necessary to have a form which can be signed by the patient, but there must be a form for a relative or guardian in case the patient is unconscious, mentally unbalanced, or a minor. To avoid duplication, the following composite form is recommended:

.....HOSPITAL
Hosp. No.

OPERATION CONSENT

The nature of the { illness from which.....
 { injury

.....{ am suffering has been fully explained to
 { is

me by.....
and I am willing that any operation should be performed which the Attending Surgeon may find necessary

for { my
 { his relief.
 { her

Witness

Date

Signed.....

The hospital, which drafted this form, uses a full-sized record sheet and has the form worded in French and in Yiddish.

RELEASE FORM

This form is desirable for patients who become dissatisfied and demand permission to go home when such action would be highly detrimental to their convalescence. Frequently they have developed post-operative hernia and pneumonia and other complications and even have died from leaving the hospital against the advice of the doctor. The following release form is recommended:

.....HOSPITAL

RELEASE FORM

I hereby certify that the nature of my illness and my present condition have been fully explained to me.

I am leaving the Hospital against the advice of the doctor and will not hold the doctor nor the Hospital responsible for anything that may happen subsequent to my discharge.

Signature.....

Witness

Date

Note: The above declaration was interpreted to me by

Signature.....

Where the removal of the patient is insisted upon by a relative or guardian, the form below is considered satisfactory. To afford legal protection, however, the hospital or the attending doctor must have reasonable assurance that the party signing the release form is the next of kin, lawful guardian, or has equivalent authority.

.....HOSPITAL

Date.....

RELEASE

To the Superintendent:—

This is to certify that I am TAKING.....
from the.....Hospital against the
advice of the Doctor and will not hold the Doctor or
Hospital responsible for anything that may happen
subsequent to h..... discharge.

Witness

Signature.....

.....

Note: I have had the above declaration interpreted to me by.....

Signature.....

CONSENT FOR AUTOPSY

The increased scientific spirit manifested by the profession and the saner viewpoint of the public have resulted in many more autopsies being performed now than a decade or two ago. A simple but adequate Consent for Autopsy is as follows.

.....HOSPITAL

Date.....

CONSENT FOR AUTOPSY

To the Superintendent:—

I, the undersigned, nearest of kin, give the.....
.....Hospital permission to hold an autopsy
on the body of.....

Witness

Signature.....

Authorized by

Superintendent
G. HARVEY AGNEW.

Provincial Association Notes

THE FORTY-NINTH ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION

The forty-ninth annual meeting of the Ontario Medical Association was held in the Royal Connaught Hotel, Hamilton, on May 28, 29, 30 and 31, 1929. Our hosts, the Hamilton Medical Society, left no stone unturned to make this meeting one of the most successful in the history of the Association. The weather was ideal, and the attendance, including ladies, was a little over 1,200.

The Board of Directors met at 9.00 a.m. on Tuesday, May 28th, followed by the Committee on General Purposes at ten o'clock, with an attendance of about sixty delegates.

The first report presented was that of the Committee on Necrology, recording the loss by death of thirty-six members of the Association during the year.

The Report of the Board of Directors touched briefly upon the work of the Association throughout the past twelve months. Special mention was made of the District Meetings, which have now become a very important feature of the Association's activities.

A motion was introduced and approved authorizing the subdivision of District Number 5, creating a metropolitan area in the city of Toronto, and incorporating the balance into a separate district.

In connection with the Report of the Committee on Legislation and By-Laws, the Association went on record as disapproving the principle of having rubbing alcohol obtainable only on a physician's prescription.

The Committee on Education reported 212 post-graduate addresses delivered during the year to forty medical societies.

The Report of the Committee on Mental Hygiene is worthy of note, in that it contains a vast amount of valuable information with reference to conditions existing in the Province of Ontario at the present time.

The following changes in the Tariff, as recommended in the report of the Committee on Tariff, were approved:—

For Town and Country Practice:

1. That the Life Insurance Fee of \$5.00 and up be deleted.
2. That intravenous medication be \$5.00 and up.
3. That the clause "using stomach pump" be changed to "gastric lavage."
4. That anæsthesia for major operations be \$15.00 and up.

For City Practice:

In addition to the four changes mentioned above, a fifth one was approved, providing for a fee of \$15.00 and up for metacarpal and metatarsal dislocations.

The Nominating Committee met on the evening of Tuesday, May 28th, when the following officers were nominated for the ensuing year, and elected by the Association the following day:

President, Dr. John Ferguson, Toronto; *First Vice-president*, Dr. A. J. Grant, London; *Second Vice-president*, Dr. Ward Woolner, Ayr; *Honorary Treasurer*, Dr. G. Stewart Cameron, Peterborough; *Secretary*, Dr. T. C. Routley, Toronto.

Counsellors, Dr. J. D. Curtis, St. Thomas; Dr. A. J. McGanity, Kitchener; Dr. S. T. White, Orangeville; Dr. J. H. Holbrook, Hamilton; Dr. W. A. Lewis, Barrie; Dr. A. J. Mackenzie, Toronto; Dr. F. C. Neal, Peterborough; Dr. L. J. Austin, Kingston; Dr. W. S. Lyman, Ottawa; Dr. W. J. Cook, Sudbury; Dr. J. C. Gillie, Fort William.

The Nominating Committee also recommended that the next annual meeting of the Association will be held in the Royal York Hotel, Toronto, on May 27th, 28th, 29th and 30th, 1930.

On Tuesday evening, May 28th, the Round Table Dinner and Conference was held under the auspices of the Committee on Inter-Relations. This was one of the most successful Round Table discussions ever held by the Ontario Medical Association. There were 150 members and guests of the Association present, and the keenest interest was manifested in the discussion on the subject of Health Insurance. Great stress was laid upon the importance of building up a strong organization of the medical profession so that, if and when any plan of sickness and invalid insurance is introduced, representatives of the organized medical profession will be able to deal satisfactorily with it, in the interests of the profession and the public. A resolution was approved, requesting the Canadian Medical Association to approach the Federal Government with the idea of having a suitable commission appointed to make an exhaustive study of the problem of health insurance, and bring forward specific recommendations as to the best remedies for existing conditions; also that the Ontario Medical Association institute a Commission to study national health insurance as it might apply to conditions in the Province of Ontario.

The scientific program consisted of General Sessions, at which nineteen very excellent papers were presented by speakers from Italy, France, United States and Canada. There were also

sectional meetings in Eye, Ear, Nose and Throat, Medicine, Obstetrics and Gynaecology, Paediatrics and Surgery.

The annual dinner of the Association was held in the Royal Connaught Hotel on Wednesday evening, May 29th, with an attendance of about 400. After dinner, the Presidential Address was delivered by Dr. E. A. McQuade, of Trenton. This was followed by an address by Professor G. B. Roatta, of Florence, Italy, on "The effects of fascism on private practice and state medicine." The remainder of the evening was spent in dancing.

On Thursday afternoon, the members of the Association were entertained at a Garden Party at "Elmwood", as guests of Dr. and Mrs. Ingersoll Olmsted. With ideal weather and beautiful surroundings, this was one of the happiest events of the whole convention.

On Thursday evening, while the Alumni Dinners were in progress, the visiting ladies were the guests of Dr. and Mrs. P. B. Macfarlane at

a very delightful musicale. A most enjoyable evening was spent and the ladies were unanimous in the opinion that it was, indeed, a fitting climax to a perfect day.

Many other very pleasant functions were arranged for the entertainment of the visiting ladies, including a theatre party, a drive, via the mountain top, to Stony Creek Battlefield, afternoon tea at the Nurses' Residence of the General Hospital, and a drive to the Mountain Sanatorium, where they were entertained by Dr. and Mrs. J. H. Holbrook.

The golf tournament for the Hamilton Medical Society Cup was played at the Burlington Golf and Country Club, the winner of the trophy being Dr. J. P. Fawcett, of Hamilton.

Eleven years ago (in 1918) the Ontario Medical Association last met in Hamilton, and it was an excellent meeting. However, many thought it was surpassed by the meeting of 1929.

T. C. ROUTLEY

Medical Societies

THE WESTERN NOVA SCOTIA MEDICAL SOCIETY

The fifth annual meeting of the Western Nova Scotia Medical Society took place in the Kiwanis Club Rooms at Yarmouth on Tuesday afternoon, May 28th at 2 p.m., with the President, Dr. J. E. LeBlanc, in the chair. Twenty-four members were present.

After the routine business was concluded a scientific address entitled "Goitre; its significance and treatment" was given by Dr. Howard M. Clute, Surgeon of the Lahey Clinic in Boston. This proved a most interesting and instructive clinical address. It was interspersed with lantern slides demonstrating the different phases and types of goitre.

Dr. Clute opened his talk by saying that the normal thyroid gland underwent hypertrophic changes in three periods in a woman's life: adolescence, pregnancy, and at the menopause. He then dwelt at length upon the colloid type, the adenomatous, the exophthalmic and the malignant. The phases by which the unoperated adenomatous type passed into the malignant were very clearly explained. He impressed the hopelessness of this type of malignancy and illustrated the importance of examining carefully by x-ray, etc., for the substernal goitre frequently missed in some physical examinations. Dr. Clute's dictum is that, with the exception of the simple type met with in adolescence, once the diagnosis goitre is made the next step is to remove the mass.

Dr. Clute dealt with the adenomatous type and the more prevalent exophthalmic goitre. He supported the various contentions with interesting statistics from the Lahey Clinic showing the results of the basal metabolic tests in periods from three to twelve months after operation, in both primary and secondary goitres, with most satisfying post-operative statistical results. Dr. Clute's teaching is that iodine should not be given except as a prophylactic and as a pre-operative medication. Given otherwise, it is his opinion that the great benefits obtained from it as a pre-operative measure are lost and for other types no permanent benefits follow its administration.

Following this clinical talk some eight patients were presented in which Dr. Clute demonstrated different diagnostic signs and explained clinically these different types of goitre. Among the cases shown were several N.C.A. cases and in these Dr. Clute demonstrated the difference between prominent glands in patients with thin necks, whose symptoms were not due to any thyroid disorder, and the differential diagnosis between these cases and toxic goitres was very clearly demonstrated clinically. Dr. Clute demonstrated several new clinical signs and particularly emphasized the value of quadriceps test as a differential symptom between exophthalmic cases and those of N. C. A. origin. In the discussion which followed, Drs. Campbell, Burton and Webster joined.

A hearty vote of thanks was moved by Dr. Farish and seconded by Dr. Gullison, extending

the gratitude of the Society to the guest for his most instructive address. From the clear exposition of the subject, as well as the well arranged slides, and the very appropriate clinical demonstration of patients having almost all the different types of goitre discussed in the address, as well as general neurasthenia, Dr. Clute's clinic proved to be one of the most instructive and completed one of the most pleasant meetings which the society has had since its inception.

The following officers were elected: *President*, Dr. A. R. Campbell, Yarmouth; *Vice-president* for Digby, Dr. A. C. Campbell, Bear River; *Vice-president* for Shelburne, Dr. L. P. Churchill, Shelburne; *Vice-president* for Yarmouth, Dr. F. E. Gullison, Yarmouth; *Sec.-Treasurer*, Dr. T. A. Lebbetter, Yarmouth.

Nominated to the Provincial Executive of the Nova Scotia Medical Society were Drs. L. M. Morton, of Yarmouth, and W. C. O'Brien, of Wedgeport; auditors, Drs. Melanson and O'Brien.

THOMAS A. LEBBETTER,
Sec.-Treasurer.

THE REGINA AND DISTRICT MEDICAL SOCIETY

Dr. G. B. Roatta, Florence, Italy, and Dr. Armand-DeLille, Paris, addressed the Regina and District Medical Society in June. Dr. Roatta, who is a councillor of the Federazione Nazionale Italiana Fascista for the Control of Tuberculosis, and is a director of dispensaries in Florence, said that Florence had had an active society fighting tuberculosis since 1900, and it now possesses a permanent seaside hospital of 150 beds for children, and a hospital of 140 beds outside the city. In addition, there are homes for children having contact with tuberculosis, a day camp, milk centres, and open air schools. Compulsory insurance against tuberculosis among all the working people of Italy has been brought about by the government; half of the premium is paid by employer and half by the worker. Full-time officials are employed for clinic and sanatorium work.

Dealing with various reforms inaugurated by the Fascisti party since it attained power in 1922, Dr. Roatta stated that all factories and other places of employment, having more than twenty-five employees, must have a first-aid station with a trained nurse in charge. A national board for protection of maternity and infancy has been established, with branches in every town and village. All normal maternity cases are delivered by midwives. The rate for puerperal sepsis is 9 per 10,000. No deaths from small-pox have occurred since 1921. The old problem of malaria has been combatted by drying the marshes and cultivating them in-

tensively. Juvenile delinquency has decreased by 50 per cent under the Fascisti regime.

Dr. Armand-DeLille, Secretary-general of the Grancher Foundation, said that it had been found that 60 per cent of new-born children whose parents have tuberculosis will also develop it, and that 40 per cent of these will die. Measures to combat this were begun by the Grancher Foundation, which came into being in 1903, and with which Dr. Armand-DeLille has been associated since 1907. Children of the affected parents have been taken from the slums of Paris and placed with families in the country for three or four years under special medical supervision. Thirty-five hundred children have been thus attended, and of this number only seven have developed the disease. The experiment began long enough ago in a number of cases to see the children grow up, marry, and themselves have perfectly healthy children.

He also described the vaccination method of Calmette, who after twenty years of research has produced a special strain of non-virulent tuberculosis, known as the B.C.G. vaccine. With this 106,000 children of affected parents have been vaccinated. This vaccine was at first given by mouth but the last two years it has been given subcutaneously. He hoped that in the course of some years tuberculosis would be as rare a disease as leprosy.

Dr. R. G. Ferguson, of the Fort Qu'Appelle Sanatorium also addressed the Society on "Tuberculosis in Europe." This was an account of his trip under the auspices of the Canadian Tuberculosis Association, in co-operation with the Anti-Tuberculosis Leagues and the Sun Life Assurance Company. In France the deaths from tuberculosis were 150 per 100,000, or more than four times that of Canada. France provided one bed for every five deaths. Saskatchewan provides two beds for every death. In France the disease was treated as an acute infection and only the open cases are hospitalized. Nearly 100,000 French children have been vaccinated against tuberculosis. English workers are bitter in their criticism of this method of vaccination; United States workers are almost as denunciatory; the Scandinavian countries are prepared to wait and see what happens to these children before speaking. Dr. Ferguson feels that the criticisms are so far mostly theoretical; none of the children have yet developed tuberculosis.

Another method of combatting the disease in France is to remove the children from homes where tuberculosis exists until five years of age, when they are returned to their parents with their resistance to the disease increased. In England it is almost impossible for a public patient to secure institutional treatment unless he has a positive sputum. While listening to

the debate in the House of Commons he learned that more than 100,000 beds had been taken over by the Department of Health this year for the treatment of infectious pulmonary cases but bone, gland, and some other types were not considered infectious by the government. The English were attacking the problem of the pre-disposed to tuberculosis by providing better houses and jobs for men who have come out of the sanatoria.

Contrasting conditions in Saskatchewan with those of Europe Dr. Ferguson stated that by November 1st, when the new sanatorium will be opened in Prince Albert, beds will be available for all cases of tuberculosis in the province, so that the disease is being treated both as an infectious disease and as a preventable disease. Part of the money from the sale of Christmas seals is being used to pay the family doctor to examine the contacts of tuberculous patients. With the rapid growth of population in the province and the opening of the northern mining areas Dr. Ferguson estimated that in another year's time, even with the increased accommodation at Prince Albert, there would be a shortage of beds, and emphasized the necessity of planning for five years ahead. Dr. F. C. Middleton, Acting Deputy Minister of Health, stated that the reason the new sanatorium was built in the north was that one-third of the deaths due to tuberculosis in the province occur north of where a line would pass if drawn through Rosthern, one-third between Rosthern and Craik, and one-third south of Craik. This shows the much higher per capita rate in the north than in the south.

LILLIAN A. CHASE

PREVENTION OF DENTAL DISEASES IN CHILDREN

At the meeting of the Section of Odontology of the Royal Society of Medicine on February 25th, Mr. George Northcroft presiding, a "casual communication" from Dr. J. Kingston Barton was read on "The prevention of diseases of the teeth in children." Dr. Kingston Barton stated that when he started in general practice, just fifty years ago, having plenty of spare time, he attended the out-patient departments of several of the children's hospitals in London. Impressed by the importance of the teeth, he printed, for free distribution amongst his patients who were mothers, sheets containing particulars of the milk dentition, the order of cutting, and the age at which (between the seventh and the twenty-fourth month) the different teeth were usually cut; then he asked that, in blank spaces provided, the age at which the teeth actually came through should be inserted, and he pointed out that any great delay in cutting should be reported to the medical adviser. Warnings and instructions were added with a view to prevent-

ing the onset of rickets, which was almost invariably the cause of delayed teething, and to ensure that the infant had food of the right kind. For twenty-five years, said Dr. Barton, he kept careful records of all the mouths which came under his observation. He found that a good state of the teeth and jaws was always associated with breast-feeding; the next best was seen in infants fed on ass's milk, or goat's milk, or fresh cow's milk; and the really bad teeth were found in children who had been hand-fed on various kinds of tinned or preserved milk foods, some of which were much worse than others in their ill effects. He also laid great stress in his practice, a generation ago, on the misuse of starch foods as given to infants. During the past twenty years it has been the fashion to scoff at the views expressed about the ill effects of starch, but in Professor Mellanby's most recent paper he noticed that emphasis was laid upon the ill effects of the too early use of various cereals in infant feeding. In the sheet just mentioned Dr. Barton had written: "Too early use of sago, rice, and bread, particularly if not well cooked, will also set up rickets." —*Brit. M. J.* 1: 400, March 2, 1929.

CANADIAN SOCIETY FOR THE STUDY OF DISEASES OF CHILDREN

The Canadian Society for the Study of Diseases of Children held its seventh annual meeting on May 27th and 28th, in Hamilton, Ont. We hope to publish from time to time the various papers read at this meeting. In the meanwhile, the following notes on its deliberations have been supplied us by Dr. H. B. Cushing.

Considerable attention was paid at the meeting to the various acute infectious diseases. A paper was read by Drs. Hannah and Murray of Toronto on epidemic meningitis, reviewing the cases treated in the Hospital for Sick Children, and urging the importance of early diagnosis and early use of serum. Their mortality was 42 per cent, most of the fatal cases being infants or cases which had not been recognized early.

Dr. Hannah also gave a vivid picture of the condition known as hæmorrhagic diphtheria, reviewing the symptoms and course of 70 cases, all of which ended fatally. In view of the absolute failure of all treatment, he urged the importance of prevention by the earlier administration of antitoxin, and especially the active immunization of all young children.

Dr. George Smith of Toronto spoke of tetanus, pointing out the importance of giving immunizing doses of serum in the case of all wounds contaminated with soil. A physician omitting this precaution might be held liable for negligence and mal-practicé. He also urged the importance of intensive treatment with large doses of serum in all cases where symptoms had developed, as offering the only hope of cure.

University Notes

Dalhousie University

Sixteen graduates in medicine were awarded their diplomas at the Convocation of Dalhousie University held on the fourteenth of May. This is the smallest medical class that has graduated from Dalhousie for some years. On that occasion, the honorary degree of LL.D. was conferred upon Dr. George David Stewart, of New York, a native of Nova Scotia who has achieved eminence in the great republic. Dr. Stewart delivered the convocation address, in which, with medical education as his theme, he sustained well his reputation as an interesting and stimulating speaker.

A gift of two thousand dollars has been made to the Faculty of Dentistry by the Carnegie Corporation for the Advancement of Teaching. The gift is to be used in strengthening the dental library.

It is interesting to learn that the medical school of Dalhousie University has been added to those actively carrying on research work. It is announced that, following the publication of some work that emanated from the Pharmacological Department, under Professor O. S. Gibbs, Messrs. Parke, Davis and Company kindly offered to supply the sum of \$1,500, to pay for an assistant to carry the investigation still farther. Owing to lack of funds it would have been quite impossible to advance the study without the help of this generous and timely gift. The subject of the research is "The action of the separated pituitary principles on the renal function of the fowl."

University of New Brunswick.

At the recent Encænna of the University of New Brunswick, the honorary degree of LL.D. was conferred on the Hon. Dr. H. I. Taylor, Minister of Health for New Brunswick. Dr. Taylor delivered the special address to the graduating class.

McGill University

At an impressive function held in the Medical Faculty Building on May 29th, the magnificent library of medical works, important in connection with the development of medical science, bequeathed by the late Sir William Osler, Bt., was formally presented to the University on behalf of the Osler family by Mr. H. S. Osler, K.C., and accepted by Principal Sir Arthur Currie. Addresses were

given by Professor W. S. Thayer, of Baltimore, and Dr. W. W. Francis, the Osler Librarian. Further information in regard to this event can be found in our Editorial column in the present issue. After the dedication ceremonies were concluded those present had an opportunity of inspecting the Library and a special exhibit of "Osleriana."

Medals and prizes in the final year of the Faculty of Medicine were awarded recently as follows: The Holmes Gold Medal, John S. Lyon Browne. The Wood Gold Medal, Howard Lailey Elliot. The Joseph Morley Drake Prize in Pathology, Henry Paul Melanson. The Lieutenant-Governor's Silver Medal, John S. Lyon Browne. The Alexander D. Stewart Prize, James Paterson McInerney. The Williams Prize in Surgery, John S. Lyon Browne. Aggregate Honours: (1) Henry Paul Melanson; (2) John S. Lyon Browne; (3) Howard Lailey Elliot; (4) James Paterson McInerney.

Queen's University

At the recent convocation in Kingston fifty-one candidates received the degrees of M.D., C.M. The following is the list of Prize Winners in the Medical Faculty:

The Robert Bruce Scholarship (\$75.00), awarded to the student making the highest number of marks on the regular examinations of the first year, was awarded to Perry E. White.

The New York Alumni Association Scholarship (\$50.00), for the highest marks in Embryology and Histology of the second year, was awarded to Frederick A. Alexander. Honours: Robert Johnston.

A Faculty Scholarship (\$50.00), awarded to the student making the highest marks on the examinations of the second year, Robert Johnston.

The N. F. Dupuis (Scholarship (\$60.00), for the highest marks in Physiological Chemistry of the third year; William C. Blackwell, and Kenneth A. Roberts.

The Boak Scholarship (\$50.00), awarded to the student making the highest marks in the written and oral examinations in Anatomy of the third year; James C. Samis.

The Dean Fowler Scholarship (\$50.00), for the highest marks on the examinations of the fourth year; Michael W. C. Feeney.

A Faculty Scholarship (\$50.00), for the highest marks on the examinations of the fifth year; Joseph A. Kearns.

The David Edward Mundell Scholarship (\$50.00), awarded to the student making the highest aggregate marks in the Surgical Applied Anatomy final examinations of the fifth and sixth years; Walter F. Connell.

A Prize of \$20.00 in gold, given by Dr. James, of Mattawa, for the best examination in final year Medicine and Clinical Medicine; Walter F. Connell.

The Canadian National Committee for Mental Hygiene Scholarship (\$50.00) awarded to the student making the highest number of marks in Psychiatry; John T. Shea. Honours, Walter F. Connell.

A Prize for the best series of Pathological Cases, given by Dr. James Miller; Walter F. Connell, and William J. Henderson.

Professor's Prize in Medicine and Clinical Medicine; William J. Henderson.

Professor's Prize in Surgery and Clinical Surgery; Walter F. Connell.

Dr. D. T. Smith's Prize in Pharmacology; Michael W. C. Feeney.

Medal in Medicine; Walter F. Connell.

Medal in Surgery; William J. Henderson. Honours; Walter F. Connell.

University of Toronto

The position of Professor of Surgery in the Faculty of Medicine, University of Toronto, and Chief Surgeon of the Toronto General Hospital, which became vacant on the death of the late Dr. C. L. Starr last December, was filled by the Board of Governors of the University on May 23rd by the appointment of William Edward Gallie, M.D., F.R.C.S., England.

Dr. Gallie graduated as a Bachelor of Medicine from the University of Toronto in 1903, and was given the degree of M.D. (*cum laude*), in 1920, for a thesis on "The repair of bone." After acting as intern for a year in the Hospital for Sick Children, he went to New York, where he spent some time in studying orthopaedic surgery at the Hospital for Ruptured and Crippled, under such famous men as Virgil P. Gibney, Royal Whitman, and William B. Coley.

Since his return to Toronto he has been actively engaged in the surgical work of the Hospital for Sick Children, where he succeeded the late Dr. C. L. Starr in 1921 as Chief Surgeon. In addition to his contributions on bone changes, Dr. Gallie has revolutionized operative procedures on hernia by the introduction of the use of the fascia lata as a living suture material, which he did on the basis of careful and thorough experimental investigation followed by its clinical application. The results of this work formed the subject of the Hunterian Oration, which he delivered as Hunterian Professor before the Royal College of Surgeons of England on April 30, 1924, under the title of "The trans-

plantation of the fibrous tissues in the repair of anatomical defects."

In 1918, Dr. Gallie became a Fellow of the Royal College of Surgeons of England. He is also Fellow of the American Surgical Association, Member of the American Orthopaedic Association, Fellow of the American College of Surgeons.

The first appointment in the Faculty of Medicine of Dr. Gallie was made in 1907 as Demonstrator of Anatomy, and in the following year, he became Demonstrator in Surgery and Clinical Surgery. In 1919 he was appointed an Associate and 1922 an Assistant Professor of Clinical Surgery.

E. STANLEY RYERSON

Medals, prizes, scholarships and fellowships, in the Faculty of Medicine, as follows, were awarded by the Senate of the University at the recent convocation.

The Gold Medal, Louis John Harris, B.A. The Silver Medals, *aeq.*, George Hamilton Hames, B.A., Charles Beecher Weld, M.A. The George Armstrong Peters Prize, Louis John Harris, B.A. The Reeve Prize, Miss C. Helen Craw. The Chappell Prize, Louis John Harris, B.A. The J. J. Mackenzie Prize, Louis John Harris, B.A. The Ellen Mickle Fellowship, Louis John Harris, B.A. The Charles Mickle Fellowship, George R. Minot, M.D., S.D. The Baptie Scholarship, Irving Creighton Sherman. The David Dunlap Memorial Scholarship, Fifth Year, Alexander Anderson Numbers; Sixth Year, George Lyman Duff, M.A.

University of Western Ontario

All students in the final year passed their school examinations and received their degrees in medicine on May 31st.

Scholarships and prizes were awarded as follows:

The Alpha Kappa Kappa Gold Medal, for the student obtaining the highest standing in the final year, R. J. Bristow. The J. B. Campbell Memorial Scholarship in Medicine, J. F. Kenzie. The J. B. Campbell Memorial Scholarship in Physiology, J. W. Gilchrist. The Class of 1917 Scholarship, L. D. Wilcox. The Khaki University and Y.M.C.A. Scholarship, W. S. Dick.

Manitoba University

A complimentary luncheon to the graduating class in Medicine of the University of Manitoba was tendered by the Manitoba Medical Alumni Association at the Fort Garry Hotel on May 15th. Dr. W. Harvey Smith, Honorary President of the Medical Students Association, spoke on the history of medicine in Manitoba.

dealing especially with the human side of the medical pioneers, their courage, resourcefulness, and enterprise. Dr. W. E. Dwyer replied on behalf of the new graduates.

Much sympathy is felt for President and Mrs. James Maclean whose youngest son, Ian, died on May 13th following a street accident.

At convocation on May 16th honorary degrees were conferred upon Dr. Henry M. Ami, the noted Canadian geologist, of Montreal; Mayor D. M. Duncan, Superintendent of Winnipeg Public Schools; Rev. R. G. MacBeth, pastor of St. Paul's Presbyterian Church, Vancouver, and a well-known author; Dr. W. C. Murray, President of Saskatchewan University, and Professor Chester Martin, recently appointed

head of the Department of History of Toronto University.

University of Alberta

The College of Physicians and Surgeons of Alberta gives five scholarships annually to the University to be awarded to medical students. The following were awards in 1929: Final year Surgery, Edward Francis Cain; Final year Medicine, Edward Francis Cain; Third and fourth year physiology, Charles Bruce Brown; Second and third years anatomy, John W. Bridge; First year proficiency, Sidney R. C. Nelson.

There were eighteen graduates in the Faculty of Medicine of Alberta University this year. All entered to take the examinations of the Medical Council of Canada.

Topics of Current Interest

BLOOD PRESSURE AND DISEASE

Almost every medical discussion nowadays shows the reversion of medical thought towards diatheses and types of constitution. The one on blood pressure at the Hunterian Society on March 25th proved no exception. Dr. Halls Dally, the opener, while enunciating his belief that the problem could only be rationalised from the biological standpoint, nevertheless ventured to lay down a certain standard of blood pressure in relation to age. Physiologically, he said, the physician might expect to find a blood pressure of 80/50 in a child of 5, of 100/50 in a child of 10, and a sharp rise with the onset of gonadal function at puberty to 120/75, while between the ages of 17 and 40 a man might be expected to show a reading of 125/80, and a woman of 115/75, both sexes rising slowly up to 135/88 at the age of 60. For venturing to give even this rough guide, however, Dr. Halls Dally was severely criticised by subsequent speakers. Dr. Campbell McClure declared that he had no interest whatever in an "average" blood pressure. Dr. Temple Gray averred that no statement had done more harm in medicine than the dictum, "A man is as old as his arteries." Some men would live to a ripe old age with arteries in an apparently hopeless condition; others would die young with apparently healthy vessels. He had seen men very ill with nephritis with a blood pressure of 85, and had known a man walking about with a blood pressure of 360. Dr. Temple Gray also pointed out that Kretschmer's four psycho-physiological types showed distinct differences in their blood-pressure levels, and Dr. McClure drew a vivid picture of the two constitutions, the high and low blood-pressure

types. The person of the low-pressure type was an unsatisfactory child at school. He might have artistic talent, but he could not shine at intellectual work. He suffered from lassitude, headaches, insomnia, and evening fatigue. He was seen by the doctor in early manhood, but seldom when he was over 50. Slow to develop, he was rarely able to put his abilities on the market before he was 40, but by the time he was 60 he had far outdistanced his high blood-pressure rival, who had shot ahead at school with exuberant vitality, carried off all the prizes in his early professional career, and died intellectually at 38. The high-pressure type came to the doctor much later in life, and suffered from many disorders of cardiac and renal function to which the low-pressure man was a stranger. The latter has, Dr. McClure thought, to beware chiefly of early cancer, which is apt to hit him before he has time to react to the environment of ageing. There is a certain structural difference between the two types which is revealed in the shape of the heart. The low blood pressure type has a tubular heart, is always short of calcium, and is liable to tuberculosis; the high blood pressure type has the "bullock-heart," is always full of calcium, and has difficulty in elimination. If he contracts tuberculosis, he recovers. Dr. Halls Dally pointed out the peculiar resemblance between the symptoms of high and low blood pressure, and described them as expressions of two opposite forms of failure to adapt to the environment. Nevertheless, there must always remain a certain number of patients in whom abnormal blood pressure, as a direct measure of the load the heart and valves have to bear, and of the vasomotor tone, calls for therapeutic measures. The decision to treat should

never be based on simple systolic readings alone. The diastolic, the differential, and probably in future the arteriolar and capillary pressures, will all prove of great significance.—*Lancet*, 1: 731, April 6, 1929.

EVOLUTION OF THE HUMAN FOOT

The H. O. Thomas Memorial Lecture, which was delivered by Sir Arthur Keith at Liverpool last May, has now been published in the *Journal of Bone and Joint Surgery*; it will repay careful study. Like all Sir Arthur Keith's handiwork, it is characterized by learning, research, keen observation, and clarity of exposition. He returns to an aspect of the subject with which he dealt nearly seven years ago (*British Medical Journal* 1: 736, 1922), filling in detail and adding the results of new investigations into the evolutionary history of the human foot. Taking as examples the feet of pronograde monkeys, orthograde apes, and man, this fascinating inquiry leads us to a study of the anatomy of the foot in each of the genera considered, and of the evolution of the muscles and tendons, in response, as it were, to the calls made upon them by the needs and habits of each genus or species. The importance of muscular action in the maintenance of an efficient foot has been long insisted upon by Sir Robert Jones, and the anatomical and developmental evidence brought forward by Sir Arthur Keith fully supports this view. The fate of ligaments when unsupported by muscles can be seen by all who will look at the deformities following anterior poliomyelitis, while, on the other hand, the apparently flat foot of the stage dancer shows that well-developed muscles can render the foot highly efficient, notwithstanding great laxity of ligaments. The mechanical arch of the foot, in an architectural sense, with its so-called keystone, is a figment of the imagination, and belief in its existence can only be retained by those whose mechanical insight is as small as their appreciation of the rôle of muscles. In examining the form and functions of the foot it is necessary, as Sir Arthur Keith points out, to bear in mind the important consideration that evolutionary alterations in the human foot involve widespread changes in all the systems of the body, and that the type of foot of the orang, the gorilla, the chimpanzee, the gibbon, and others is the response of evolution to the demands of the whole organism. Lord Monbodo, with his admirer Peacock, and others, believed that modern man was the degenerate descendant of giant ancestors. In a sense Sir Arthur Keith supports this view, for he sees reason to think that we may be descended from giant arboreal ancestors, whose bodies, like that of the East African gorilla, became too

heavy for climbing; they adopted, therefore, a terrestrial life, and developed a heel-bearing plantigrade foot. This study of the structure, and especially of the muscles of the foot of the gibbon, the great apes, and man, shows beautifully how the human foot may have developed from that of an unknown arboreal ancestor to its present state; Sir Arthur Keith confesses his ignorance how this has been brought about, but declares his certainty that the change has been effected "by biological means which are still resident in the body and will be discovered." The forces which we call Providence or Nature have thus, through uncounted ages, been busy fitting us with feet suited to the needs of barefooted man, but European man compresses all this elaborate mechanism of bones, muscles, and ligaments into a stiff unyielding case, which allows only a few of the crudest movements of the foot. We may judge to what an extent this restriction has been carried by the fact that the movements of the foot in everyday use can be so successfully imitated by an artificial one as to defy detection when the amputation is below the knee. Yet such a prosthesis, in place of the elaborate mechanism of the living foot, has only one joint which allows a hinge movement at the toes, and another outside the foot proper, at the ankle. Woman, meanwhile, emulous of her pronograde ancestor, raises her heel three inches from the ground, and destroys the efficacy of the hallucial lever by forcibly squeezing her great toe into a position of complete mechanical inefficiency. Yet despite this her athletic achievements surpass all that we have heard of Atalanta or the Amazons.—*Brit. M. J.* 1: 463, March 9, 1929.

THE LONDON ZOOLOGICAL SOCIETY

One hundred years ago King George IV granted to the London Zoological Society a royal charter "for the advancement of zoology and animal physiology and the introduction of new and curious subjects," and on Monday last, at a special meeting held in University College, London, the society celebrated the centenary of this great event in its history. The study of zoology has always had a special attraction for medical men; the subject forms, and of necessity must always form, an essential part of the curriculum of the medical student, who, because he must become biological in outlook, has to realize that medical science itself involves but the intensive study of one of the highly developed animals. Many of the most celebrated zoologists have belonged to our profession, or else, like Charles Darwin, have been diverted to specialization in zoology while engaged in the study of medicine. Small

wonder, then, that a large number of physicians and surgeons are not only Fellows of the Society, but are actively identified with its activities. The post-mortem room has been called the Palace of Truth from which many who have entered with one label have departed with another. No less valuable than the necropsy on the human subject is the study of comparative anatomy and pathology conducted in the society's prosectorium, and it is noteworthy that famous men closely associated with that work—Richard Owen, Huxley, Alfred Henry Garrod, W. A. Forbes, H. G. Plimmer, Murray, Elliot Smith, and Leiper—have also been members of the medical profession. Perhaps it is because for the past few years all the comparative anatomists of the society and its pathologists have been medical men that much of their contribution to knowledge has had a direct bearing on human health and sickness. Human anatomy has been enriched by Sonntag's work on the primates; the work of Bland-Sutton and H. H. Scott, now being ably continued by A. E. Hamerton, has added largely to our knowledge of human pathology. Even more than anatomy and pathology, the science of parasitology—because its study in man is inseparable from its study in animals—has been advanced in the society's prosectorium. Notable in this connection is the work of Beddard and Nicoll before the war, and since then of Leiper and his colleagues, who moreover, have rendered invaluable service by providing a number of the younger parasitologists with material for study. Though the medical profession as a whole has appreciated the value of comparative medicine only since the war, many of its leading members have long been engaged in its study, and nowhere more fruitfully than in the London Zoological Society's gardens. In this connection our profession owes a deep debt of gratitude to the society, and in particular to its brilliant secretary, Dr. P. Chalmers Mitchell, without whose assistance it is probable that much of the research work in comparative medicine could never have been carried through. The appointment of Dr. G. M. Vevers to the post of superintendent, hitherto occupied only by professional zoologists, is a further guarantee that every opportunity will be taken to foster the relation between zoology and general medicine.

Its work has by no means been confined to the prosectorium. The new aquarium is a vehicle for investigating the relation of food supplies; the gardens afforded conditions unattainable for the study of economic entomology; the library, one of the finest of the student and worker the zoological literature. We con-

gratulate the society on its hundredth birthday. Not only has it captured the popular imagination as no other similar society in any part of the world, but it has prosecuted and encouraged active research into problems of fundamental importance to human and comparative anatomy. It enters its second century with the best wishes of the medical profession.—*Brit. M. J.* 1: 821, May 4, 1929.

TENDENCIES OF MEDICAL EDUCATION IN AMERICA

The transition from individualism and *laissez-faire* to communal interference and even control, effected in this country during the middle of the nineteenth century, has had its counterpart in the United States during the last fifty years. As in England so in America, this evolution has not been achieved without considerable changes in social theory—changes, moreover, which have not been confined merely to the domains of politics and economics, but have invaded that synthesis of ideas and beliefs and aspirations collectively known as the spirit of the age. When economic life was dominated by *laissez-faire* so were other institutions, so even was ethics. The gradual supersession of individualism in industry, the revolution which began with factory legislation and moved irrevocably to trusts and rationalization, has been accompanied by a transformation not only in political theory, but by a corresponding change in the structure of nearly all social institutions. In America the most striking changes have been effected in medical education. William Low Bryan, President of Indiana University, writing in the *Journal of the Association of American Medical Colleges*, states that in the past fifty years America has seen the substitution of extreme licence in medical education by the other extreme of social control. As recently as twenty-five years ago America swarmed with medical schools, each autonomous and determining its own course of study and standard of qualification. Many of these schools were fraudulent and unable to give proper training for medical practice. Then, under the inspiration of the American Medical Association, came the passing of *laissez-faire*; schools were inspected with relentless thoroughness, black lists were published, and the weaker schools perished by the score. Within an astonishingly short time so extreme a revolution has been wrought in medical education that there are now signs of a reaction towards the old individualism. In other educational institutions, in the colleges of arts and sciences, this reaction is already an accomplished fact: daring educational experiments are being made, and here and there students are immune from strict prescription in their course of study. In Indiana

the non-medical student is free of all rules except that he must not shoot a professor; Mr. Bryan does not state if this rule is rigidly enforced. Significant of the present-day tendency—the tendency perhaps to blend what is best in social organization with a healthy individualism—is Mr. Bryan's peroration. "Across the path of every man," he says, "are the traffic cop, the health officer, and the rest of the police. What is infinitely more important, across the path of the youth are the schools and licensing boards which allow him or forbid him to make his living at his chosen profession. . . . Our task, and if necessary our fight, is to keep the school and all standardizing agencies in continuous living adaptation to the needs of man."—*Brit. M. J.* 1: 614, March 30, 1929.

THE IDEA AND THE METHOD IN MEDICAL RESEARCH

Claude Bernard,* in his "Introduction à l'étude de la médecine expérimentale," summed up briefly the relationship between the idea and the method in research:

The experimental method cannot give new and fruitful ideas to men who have none; it can serve only to guide the ideas of men who have them, to direct their ideas and to develop them so as to get the best possible results. . . . As only what has been sown in the ground will ever grow in it, so nothing will be developed by the experimental method except the ideas submitted to it. The method itself gives birth to nothing. Certain philosophers have made the mistake of according too much power to method along these lines.

In view of the emphasis placed to-day on scientific interest and research in our medical schools, and of the large and increasing numbers of persons engaged in medical research, it appears worth while to restate the relative importance of the idea and the method, with some indication of the contributions to medical knowledge that may be expected from various types of research. To quote Claude Bernard further,

Men with a presentiment of new truths are rare in all the sciences; most men develop and follow the ideas of a few others. . . . We usually give the name of discovery to recognition of a new fact; but I think that the idea connected with the discovered fact is what really constitutes the discovery.

Obviously, only a small proportion of those actually engaged in medical research are born investigators; what may be expected, then, from the vast majority in whom training in the methods of investigation is substituted for creative genius? From the majority of them, nothing! Included among these are the large numbers of young men who try their wings and fail

to discover a real liking or aptitude for scientific work. Yet their seemingly futile efforts must not be regarded as waste, since from the ranks of the beginners must be drawn the successes as well as the failures. Moreover, no one, however inept, can have first hand contact with the difficulties of advancing knowledge without carrying away with him some appreciation of the scientific method and of the way in which progress is made. The tragedy comes only when the misfit, through bad judgment or advice, continue to go through the motions of research instead of striving for a career in other directions.

From another group may be expected accurate observation, particularly valuable in establishing new facts or in confirming the results of others. Thus every discovery of a new therapeutic method must be subjected to widespread trial and, on the results of such trial, finally accepted or rejected. Much of this trial is quite unscientific, but there are now sufficient numbers of scientifically trained observers to make possible the rapid evaluation of any newly introduced therapeutic method, so that the issue does not remain long in doubt. Many of these observers are clinicians, scientifically trained, who find time in the busy routine of practice to observe accurately, and their contributions to medical knowledge must not be undervalued.

Still another group, working either in the laboratory or in the clinic, are capable of painstaking contributions by what may be called the analytic method. This method, which is the one employed by the majority of established investigators, varies from the minor setpiece of research, the German *arbeit*, to elaborate investigations having as an object the analysis of natural phenomena, with the hope of re-synthesis and complete understanding of the subject under investigation. It may be and usually is employed by the investigator well trained in scientific method but lacking in original ideas, and from the method come many pieces of solid contribution to knowledge. The only danger here lies, as pointed out by Claude Bernard, in attributing too much power to method as a substitute for ideas.

Finally come the favoured few in whom the value of the idea transcends all questions of method. Theirs are the intellects which are so endowed as to perceive and grasp the subtle and delicate relations which exist but of which the average mind is not aware. An idea arises in such a mind which "may be a sort of intuitive anticipation of successful research." From these few, and from these only, may we expect great and strikingly original contributions to medicine. That they must use the methods common to all investigators in establishing the truth of their ideas is of course

* Bernard, Claude: *An Introduction to the Study of Experimental Medicine* (English translation), New York, p. 34, 1927.

understood, but the place of method in their lives is distinctly subordinate to the idea—and rightly so!—Editorial, *J. Am. M. Ass.* 91: 1111, Oct. 13, 1928.

A WARNING TO STRONG SWIMMERS

Dr. W. A. Young, director of the Medical Research Institute of the Gold Coast, was a particularly expert swimmer, and before his death from yellow fever last May he wrote an article in the *West Africa Journal* suggesting a possible cause of fatalities in surf-bathing. In not a few autopsies on native bathers found washed up on the beach Dr. Young noted that the lungs were aerated and there was no water in the stomach, but this organ occasionally showed some distension. He was in the habit of returning the cause of death as heart failure from prolonged exertion, but a paper on hypochlorhydria and air-swallowing suggested to him that the air-swallowing which took place while swimming might cause sufficient distension of the stomach to lead to functional angina pectoris. In order to swim out to sea against large breakers it is necessary to dive deeply, and even on the surface breathing is a matter of picking the right moment and dodging the foam and chop. It is therefore necessary to hold the breath for long periods and to breathe in quick gulps as opportunity offers. While these gulps may themselves cause a certain amount of air-swallowing, Dr. Young thought it more probable that air entered the stomach while the swimmer was under water. After the breath has been held against exertion for a certain length of time, he said, the respiratory centre refuses to be controlled; the expiratory muscles contract slightly, the cheeks puff out a bit, and air is swallowed. On reaching the surface, even though a deep breath be taken at once, he had noticed that there was sometimes a slight feeling of nausea and a curious sensation of lack of confidence. Eructation gave immediate but not complete relief; it had to be repeated several times to restore well-being, and there might be actual vomiting. Both from his own experience and from post-mortem findings Dr. Young believed it likely that this pneumatic distension of the stomach could cause reflex cardiac failure. As he remarked, this bears out the traditional advice "not to bathe on a full stomach"; it is not so much the food that matters as the room it takes up, so that a very little air

can cause a lot of distension. If eructation is impossible—and it is a feat of which not everyone is capable—the remedy suggested was to let the air slowly trickle out of the mouth under water when the respiratory strain became too great. This should relieve the intra-buccal pressure and avert the necessity for swallowing.—*The Lancet*, 2: 1351, Dec. 29, 1928.

MEDICAL PRESCRIPTIONS OF ALCOHOL

The Bureau of Prohibition of the Treasury Department has just made available statistics regarding the use of intoxicating liquors under official auspices in the United States. The pamphlet concerned provides statements pertaining to the amounts of various types of alcoholic liquors produced and used at various times previous to and since the passing of the eighteenth amendment, as well as full information concerning arrests, seizures and other activities of the Prohibition Department. During 1928, 68,951 physicians used prescription books as contrasted with 48,097 in 1927. The number of licensed physicians in those states which permit the use of liquor for medicinal purposes is 116,756, so that a little more than one-half the total number of physicians permitted to prescribe alcoholic liquors avail themselves of the opportunity. During 1927, 14,948 physicians used one book during the year; 8,743 used two books; 10,861 used three books and 13,545 used four books. Apparently, therefore, slightly more than 10 per cent of all the physicians who might prescribe alcoholic liquors used the total number of prescriptions afforded them by the government. The total number of prescriptions issued during the year increased from more than eight million in 1922 to approximately thirteen and a half million in 1925 and then decreased to less than twelve million in 1927. July 1, 1927, there were outstanding 94,958 permits for physicians, dentists and veterinarians to prescribe and use intoxicating liquor. During the year 16,906 new permits were issued, 10,405 were canceled, surrendered or expired, and 407 permits were revoked. At the close of the year, therefore, the number of outstanding permits of this kind had increased to 101,052. These figures are offered without comment in order that the medical profession may have some conception of the status of medical prescription of alcoholic liquors.—*J. Am. M. Ass.* 92: 1130, March 30, 1929.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

Sir Alfred Ewing, K.C.B., LL.D., the retiring Principal of Edinburgh University received the freedom of the City of Edinburgh on April 18th. Lord Provost Sir Alexander Stevenson presided, and spoke of Sir Alfred's distinguished career as a teacher and administrator during his thirteen years as Principal of the University. In replying, Sir Alfred reminded his audience that it was fifty-eight years since he first entered Edinburgh University. He recalled to memory some of his teachers, P. G. Tait, Fleming Jenkin, and, possibly the greatest of these, the late Lord Kelvin. He referred to the fact that the "Tounis' College" had been opened in 1583 at one of Scotland's recurrent periods of conflict and difficulty, when the country was still glowing from the influence of Knox and Buchanan. The Town Council had founded and had fostered and cherished it during the succeeding centuries, until it had come to be recognized throughout the world as the University of Edinburgh. During the thirteen years that Sir Alfred Ewing has been Principal, the University has greatly expanded. Financial assistance has been received in the form of generous bequests from old students and friends of the University and of gifts from public bodies, including the Rockefeller Trust and the International Education Board. Apart from the annual income and special grants received from time to time from the Carnegie Trust and from the University Grants Committee, a sum of £844,000 has been gifted from bequests, private sources and public bodies, of which £296,000 have come from individual donors.

Sir Thomas Henry Holland, K.C.S.I., K.C.I.E., is to succeed Sir Alfred Ewing as Principal of Edinburgh University. He is at present Rector of the Imperial College of Science and Technology in London. Sir Thomas is one of the foremost scientists of the day, and is President-elect of the British Association which meets this year in South Africa. He is the son of the late Mr. John Holland of Springfield, Canada, and was born in 1868. He joined the Indian Service and held various important appointments in the East. He had charge of the Indian Geological Survey from 1903 to 1909, and was a Fellow of Calcutta University and Dean of the Faculty of Science. In 1909 he left India to become a professor of Geology and Mineralogy at Manchester University. In 1917 he was President of the Board of Munitions in India. In 1920 he was appointed a member of the Governor General's Council of India, holding the position till the following year. He has been chairman of the

Council of the Royal Society of Arts, and vice-president of the Royal Society. This is not the first time that Edinburgh has appointed a Principal with Indian experience, and in this connection Sir William Muir's term of office from 1884 to 1903 will be recalled. It is not inappropriate that the new Principal should have this association with our Eastern Empire in view of the numbers of Indian students that come to Edinburgh for education and training. It is further a matter of congratulation that Sir Thomas Holland should be by birth a Canadian. The new appointment should emphasize the international character of this Imperial seat of learning, thronged as it is with students from all parts of the world.

The Franklin Institute of the State of Pennsylvania has awarded the Elliot Cresson gold medal to Principal Sir James Irvine, of St. Andrew's University, "for his brilliant research on carbohydrate chemistry." The medal is to be presented on May 25 within the Franklin Institute, and will be accepted on behalf of the Principal by Sir Esme Howard, British Ambassador to the United States.

The appointment of His Royal Highness the Duke of York to be Lord High Commissioner to the General Assembly of the Church of Scotland has been acclaimed with pleasure throughout Scotland and the general satisfaction has been enhanced by the fact that His Royal Highness will be accompanied by the Duchess of York. This is the last occasion that the Church of Scotland will hold its independent Assembly, as October next will see its union with the United Free Church. During their stay at the Palace of Holyroodhouse the services of the Duke and Duchess will be greatly in demand visiting and opening various public institutions. They are to lay the foundation stone of a new institution for mental defectives which is to be erected on the estates of Gogarburn and Kellerstain near Edinburgh. This site comprises 420 acres, and the institution when completed will offer accommodation for 500 inmates, which may be raised to 1,000 by the erection of additional dormitories. This home is meant to serve not only Edinburgh but also the South Eastern Counties of Scotland. It is to be not only a place for adult defectives but also for defective children under sixteen years of age. The entire scheme is expected to cost more than £400,000. In addition their Royal Highnesses will visit Inverness on May 17, for the purpose of opening the new buildings of the Northern Infirmary.

Sir George Berry, M.D., and Mr. John Buchan, LL.D., have been invited to become prospective Unionist candidates for the Scottish

Universities at the forthcoming General Parliamentary election. Sir George Berry succeeded Sir Watson Cheyne in the representation of the Universities in 1922. He is consulting surgeon-oculist to His Majesty in Scotland, as well as ex-president of the Royal College of Surgeons, Edinburgh, and of the Ophthalmological Society of the United Kingdom. Mr. Buchan is the well-known author. He became a representative of the Universities at a by-election in 1927 on the death of Sir Henry Craik.

The Governors of the Astley-Ainslie Institution have appointed Lieut-Colonel John Cunningham of the Indian Medical Service to be Medical Superintendent of the Institution. Colonel Cunningham who graduated M.B., Ch.B., in 1904, was until recently Director of the Institute of Preventive Medicine, Guindy, Madras, S. India, and was formerly Assistant-Director of Central Research Institute, Kasauli. He has contributed various articles on clinical medicine to medical publications. He is a son of the late Professor D. J. Cunningham, Professor of Anatomy in the University of Edinburgh, and the editor of the well-known textbook. The Astley-Ainslie Institute has been in the course of construction during the last three years at Millbank at the south side of Edinburgh. It is intended for the reception of patients from the Royal Infirmary, who are to be sent there during an early stage in their convalescence. It is hoped by this means to be able to curtail the length of stay of the patients in the wards of the infirmary and so relieve the long lists of those awaiting treatment.

GEORGE GIBSON

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

With the orientation of medicine towards the preventive side has come a new outlook upon dentistry. In the old days, not so very long ago, the dentist was a strong man who possessed a pair of forceps and a chair. Then the study of conservative methods of treating diseases of the teeth began to make its appearance, while the last steps were only taken within recent times, and include such work as that of Mrs. Mellanby on the relation of diet to dental disease and the development of the school dental service. Already the teeth of the school-child are beginning to show improvement, and with the idea of preventing development of dental disease many municipal and educational authorities are employing a "Dental Officer of Health" whose object is to keep people's teeth from going wrong, just as the medical officer of health safeguards the health of the inhabitants of the area where he works. The result has been a great expansion in the public dental

service and recently the British Dental Association has given serious consideration to the question of establishing a diploma in public dentistry. This would be a post-graduate diploma with work lasting over a year, both theoretical work, such as principles of sanitation, vital statistics, oral hygiene, etc., and practical work under the supervision of a senior dental officer. The public health dentist would be required to have had first-class experience of work in maternity and child-welfare centres, venereal disease and tuberculosis clinics. He would also have to gain special experience in the handling of children, among whom much of his work would lie. So far these proposals have had a disappointing reception by the university and licensing authorities. Perhaps some encouragement may be taken from the recent establishment of a large new dental clinic in connection with the Royal Free Hospital. The foundation stone of this was laid by the Prince of Wales, and the clinic is the result of a gift of £200,000 by Mr. George Eastman, of the Eastman Kodak Company.

With disarmament glibly on the tongue of all politicians, and a definite pacific outlook among the nations of the world, it seems strange that an International Congress of Military Medicine should find much to occupy its interest. Yet the fifth of these congresses held in London last month was attended by some 800 members, including official delegates from close upon forty countries. The principal meetings were held at the House of the British Medical Association, where Sir Laming Worthington-Evans, the Secretary of State for War, performed the opening ceremony and the congress was inaugurated by the President, Lieut-General Sir Matthew Fell, Director-General of the Medical Services of the British Army. It cannot be said that anything very startling was brought forward in the discussion, but perhaps an exception might be made in favour of some of the details given on the transport of the wounded by air. This method which has been under trial in various parts of the world for some years is now so far accepted that one speaker referred to it as "a routine method of evacuation." Anyone who studies the development of the motor ambulance service in this country will see that first of all the Red Cross Society gained great experience in war-time, transferred its experience to the municipal health authorities during the succeeding years, and out of this has been built up a magnificent ambulance service all over this country. In the same way the development of an air-ambulance service by the military authorities may well in time have its development in civil life. After reading the reports of the Congress, all to do with war, it all seems rather stupid

to talk of peace and yet be discussing the best way of dealing with the wounded!

In 1908, a Royal Commission on the Feeble-minded estimated that there were just over four mentally deficient people per 1,000 of population. Now, some twenty years later, despite all public health efforts, the incidence figure is estimated at 8.5 per 1,000 and this comparison ignores the general increase in population. In other words there are 300,000 mentally defective persons in England and Wales and the report of the Joint Committee of the Board of Education and the Board of Control on Mental Deficiency, which has just been issued, gives some indication of what is to be done about this problem, especially as it affects children. It is suggested that, provided a child is not so backward as to be completely "uneducable," then there will be no need for certification, and mentally defective children will merely be recommended to special schools between the ages of 5 and 15, and apart from this there shall be no differentiation in these age limits between normal and mentally defective or retarded children. For children of the lowest grade "occupational centres," rather than schools, will have to be provided and residential centres will also form part of the scheme. By the Educational Acts and

Mental Deficiency Acts the mentally defective child ought to be well looked after but somehow this does not always happen. The Report strongly urges those measures of co-ordination necessary to carry out the provisions already existing legislation.

About one year ago the proposed clinic for the treatment of rheumatic diseases in London was described in these notes. It is now announced that the building is in full progress of construction and is likely to be opened in September. All the money necessary for the building has been collected, and it is to be of a sufficient size to treat a normal average of 400 cases a day. It will be remembered that the Clinic was suggested by the British Committee on Rheumatism, who worked out the final scheme with the Red Cross Society and issued a joint appeal. All varieties of treatment, such as radiation, manipulation, massage, douches and electrical applications will be available. Those patients able to pay will be asked to do so, while the various industrial assurance societies will contribute. A consulting staff of honorary physicians has been appointed and everything is ready for the opening.

ALAN MONCRIEFF

London, June, 1929.

Abstracts from Current Literature

MEDICINE

Silicosis among Rock-Drillers, Blasters, and Excavators in New York City. Smith, A. R. **A Study of Silica Dust in Hard Rock Drilling in New York City.** Fehnel, J. W., *J. Indus. Hygiene* 11: 39, Feb. 1929.

In view of the extensive construction work under progress in most of the cities of the North American continent, the above studies are strikingly significant, as indicating the widespread character of silicosis.

Rock-drillers, blasters and excavators, 208 in number, engaged for the most part in subway construction, were subjected to careful study, and the surprisingly large number, 118 (or 57 per cent), of the men examined showed evidences of having the disease in its various stages. Rock-blasters as a group were the main sufferers. Dust particles 10 microns and under in size seem to be the chief cause. Prolonged exposure to, and concentration of the dust, are the main factors leading to silicosis and tuberculosis of the lungs. The outstanding physical manifestations of the disease were dyspnoea and expectoration. Physical signs revealed nothing of diagnostic value without a radiographic study of each individual case.

An ante-primary stage of the disease is considered in these studies, and it is pointed out that only by early diagnosis will we gain ground in eliminating this hazardous disease.

The advanced stages of silicosis seem to have a relationship to a previous history of pleurisy and pneumonia. As a pre-phthisical menace silicosis is undoubtedly a serious condition. The number of definitely established cases of tuberculosis was 19 (or 9 per cent) of the total cases. Tuberculous lesions were three times as numerous among the advanced cases of silicosis. The recommendations given at the conclusion of the report are worthy of careful consideration. It is obvious to everyone of us that any success in checking silicosis will be obtained by preventive measures. The following are outlined.

The use of well fitting masks. These are of little preventive value. The prohibition of jack-drilling, and the substitution for this of jacks-hammers fitted with water supply attachments. This method, though far from ideal, is nevertheless a noteworthy improvement. The attachment of sludge-and dust-collectors to the drilling machines. Proper ventilation, especially where tunnelling is being carried out. This is probably the best practical measure at our disposal. The reduction of dust-concentration, obtained by the

proper spacing of drillers while they are at work.

Silicosis should be made a universally compensable disease. In this regard, and to obtain the greatest measure of satisfaction on all sides, the diagnosis should be in the hands of experts who are thoroughly conversant with all the phases and manifestations of the disease, both from the physical examination standpoint, and even more so the radiological. Then, and then only, will the present unsatisfactory state of affairs be dealt with adequately. J. R. FORREST

The Diagnosis of Lobar Pneumonia. Fitz, R., *New Eng. J. Med.* 200: 20, May 16, 1929.

The onset of pneumonia may be so sharp, sudden, and painful that its beginning can be dated almost to a minute, or it may be difficult to tell when the attack of bronchitis or grippe ends and the more serious illness begins. Any case with cough and even slight fever deserves rest in bed as a preventive measure against pneumonia.

Pain in the chest was the next most common symptom; blood-tinged sputum occurred in over one-third of the cases; 55 per cent of the cases were conscious of some sudden change in their heat-regulating apparatus as the disease began. Few patients were consciously short of breath. Vomiting may usher in an attack of pneumonia. Finally there is a group of patients with pneumonia who are obviously ill and yet have no definite complaint beyond a profound degree of prostration.

Pneumonia at its onset is rarely accompanied by no increase in body temperature, pulse or respiration rate. Usually the temperature is 102 degrees, the pulse rate 120, and the respirations thirty or more to the minute. Certain common mistakes are easily made. It is difficult to examine a patient's back unless he is sitting upright; a patient is not harmed by being elevated to a semi-sitting position. Fluid in the chest may produce all the signs of consolidation except increased tactile fremitus. A pericardial effusion is often accompanied by an area of varying size at the back of the left chest, over which appear physical signs of frank consolidation.

The examination of the urine is not of help in the diagnosis. The white blood count is usually elevated, but occasionally is normal or subnormal. Often in young people pneumonia and appendicitis are confused, but if the suspects are carefully examined fewer patients with pneumonia will be subjected to laparotomy.

Elderly patients with suggestive signs of consolidation in the chest, but without concomitant fever, should be suspected of having some other illness than lobar pneumonia.

LILLIAN A. CHASE

Water Balance in Cardiac Decompensation.

Van Valzah, R., McKinley, E. D., and Middleton, W. S., *Am. J. M. Sc.* 177: 244, Feb. 1929.

Oedema is caused largely by dilatation of capillaries and veins because of faulty circulation. Other possible causes are increased filtration pressure, increased permeability of capillaries, delayed absorption of fluid by the tissues. The kidneys play a great part in elimination and their efficiency depends on glomerular filtration, which again varies with venous pressure in an inverse ratio, i.e., falling venous pressure means diuresis.

These facts indicate the importance of the water balance in cases of decompensation. The urinary output should be 60 per cent of the fluid intake; above this point it can be termed diuresis.

One hundred and eight cases of cardiac decompensation have been studied to demonstrate this point of view. The fatal cases invariably showed a poor response to bed, rest and other measures, while the cases that recovered showed definite diuresis. Both classes reacted at first, but the fatal type later fell below the output intake safety point, while those who did well kept above it. The factors influencing diuresis are then considered, rest in bed being given its proper importance. As regards diet, the chief points are low fluid and salt restriction. *Drugs.* First comes digitalis, effective because it improves circulation. When this fails we come to such diuretics as theobromin, theophyllin (theocin-synthetic). Cases are quoted with charts showing the successful reaction after using these agents. Mercury is also discussed—to be used only when the kidneys are intact—Niemeyer's pill, calomel, novasurol for intramuscular use, as this has a delayed action.

Altogether the authors prove conclusively that the water balance will serve as a very good therapeutic and prognostic guide in these cases.

P. M. MACDONNELL

Post-Operative Gastric Acidity. Lindsay, E. C., and Evans, W., *Lancet* 1: 651, Mar. 30, 1929.

From a study of gastric acidity in relation to the operation of gastro-jejunostomy for peptic ulcer certain observations are made, some corroborating and others at variance with previous evidence. Ewald test meals were performed before operation, shortly (14 days) after operation, and again at a considerable period after convalescence, this latter interval varying from six months to eight years. Free hydrochloric acid findings only are given. A state of achlorhydria may be produced after operation, but in the larger percentage of cases this is not permanent and may be a result of post-operative bleeding or other transient factors. The value of the early post-operative acid

findings is questioned. A persistent absence of free hydrochloric acid was found in only 18 per cent of the cases. The final post-operative acidity level bore no relation to the pre-operative reading and seemed little affected by alkali therapy, smoking, and the use of alcohol. A high acidity result was not incompatible with perfect health. No tendency to jejunal ulceration was noted in those patients who retained high acid values. Some factor other than the neutralization of stomach acidity by regurgitation through the stoma must account for the effectiveness of this operation in the relieving of symptoms and the healing of duodenal ulceration.

J. B. ROSS

Nervous Complications Following the Use of Therapeutic and Prophylactic Sera. Kennedy, F., *Am. J. M. Sc.* 177: 555, 1929.

In a brief report the author cites cases illustrative of different types of nerve palsies which may follow the use of sera or vaccines for therapeutic purposes, and suggests a method by which these complications may be overcome. He points out that serum sickness with the clinical picture of high fever, urticaria, leucopenia, and acutely inflamed joints, is well recognized, but that angio-neurotic oedema affecting the brain and meninges in the course of serum sickness is also not uncommon. Focal oedema in the central nervous system may give rise to transient aphasia, transient swellings of the ocular papillae, and transient palsies and convulsions, synchronizing with urticarial manifestations outside the nervous system. The paresis may involve half of the body or a single muscle. It is often of the lower motor neurone type, resulting in muscular atrophy and loss of function for six months or longer.

Although these manifestations when they occur, usually follow the giving of serum they may rarely result from the giving of typhoid or other vaccines for prophylactic purposes. The urticarial oedema of the perineural tissue is probably of more importance than the toxicity of the serum or vaccine.

The intravenous injection of sodium bicarbonate prior to injection of serum is advocated as a preventive against serum reactions.

E. S. MILLS

SURGERY

Primary Epithelium of the Vulva. Rentschler, C. B., *Ann. Surg.* 89: 709, May, 1929.

This paper is a review of seventy-one cases of primary epithelioma of the vulva seen at the Mayo Clinic over a period of twenty years. It is evidently a comparatively rare disease and most common between the sixth and seventh decades. The youngest patient was twenty-seven years and the eldest eighty-six. Trauma is of

no etiological importance, but chronic irritation, such as pruritus, if it exists before there is any sign of tumour, is an etiological factor, for 40 per cent of the patients gave a definite history of it. The most common symptom is itching. Ulceration may appear any time during the course of the disease, but 47.5 per cent of patients had ulceration when first examined. With the ulceration there is pain, more or less discharge, and sometimes slight bleeding. This condition gives rise to sleeplessness, secondary anaemia, cachexia, and sometimes urinary complaints.

Early diagnosis is of primary importance and women suffering from pruritus should be instructed regarding the value of repeated examination. In the differential diagnosis metastatic growths, tuberculosis, and syphilis must first be eliminated. The local lesion may be of the superficial vegetative type or of the deep infiltrative type.

Metastasis may occur any time during the course of the disease. The lymphatic drainage, with the exception of that of the clitoris, is first to the inguinal lymph nodes, usually on the same side, but cross drainage is anatomically possible and not infrequent. The lymphatic drainage from the clitoris is usually directed into the pelvis, and the inguinal lymph nodes drain directly into the pelvis. Palpable lymph nodes may not contain malignant lymph cells, but conversely the nodes may contain malignant cells without being palpable. The lesion is most frequently in the labia majora, and the average grade of malignancy is grade two, approaching grade three rather than grade one.

Regarding treatment, wide excision of the local growth and excision of the superficial and deep lymphatic glands on both sides, whether enlarged or not, is recommended. This should be supplemented by radium and x-ray. In malignancy of the graver types, namely grades three and four, this author believes it wise to excise only the local growths and supplement this by radium and x-ray applied over the site of the original growth and the lymphatic drainage.

In the series studied forty-five patients are dead and all except one died of carcinoma. The remaining seventeen patients of the series are still living, and of these thirteen are free from recurrence. The prognosis is fair for prolongation of life, but poor for cure.

R. V. B. SHIER

Tumours of the Parathyroid Glands. Guy, C., *Surg., Gyn. & Obst.* 48: 587, April 1929.

Much work has been done and a great many articles have been written on the physiology and pathology of the parathyroid glands during the past twenty-five years, but comparatively few articles have been written on the possibility

of tumours. There is apt to be confusion between thyroid and parathyroid neoplasms.

The author reports in detail a case of parathyroid tumour, occurring in a white woman who was a patient at the Cook County Hospital, Chicago, in 1926. A complete study of this case and also a review of the literature leads him to the following conclusions:

Adenomata of the parathyroids are comparatively rare tumours. No unquestionable case has been reported in which a tumour developed from a parathyroid rest in the thyroid gland. It would appear that benign tumours of years' duration may suddenly take on malignant characteristics. It is difficult to decide definitely between true adenoma formation and hyperplasia in the cases of parathyroid enlargement. The connection between neoplasms of the parathyroids and diseases of the bones is not definitely known. It would appear that compensatory hyperplasia of the remaining parathyroids after removal of one or more of the glands may occur rapidly. The histological picture of tumours of the parathyroids varies considerably in the predominance of cell types.

R. V. B. SMIER

Dupuytren's Contraction. Kanavel, A. B., Koch, S. L., and Mason, M. L., *Surg., Gyn. & Obst.* 48: 145, Feb. 1929.

In this paper the authors review the literature on the subject of Dupuytren's contraction and report on 29 cases treated surgically. As a result of their experience, the importance of wide excision is emphasized, not only of the contracted fascia but of all its attachments to the skin, the interfascial septa, and the volar interosseous fascia. Care should be taken in the dissection and elevation of the skin to minimize trauma and avoid consequent necrosis. All skin that is hopelessly involved should be removed and free full thickness grafts should be inserted. No attempt should be made to bring the edges of the wound together under tension. Where there is marked contraction of the fingers the heads of the proximal phalanges should be excised, and the extensor tendons of the affected fingers should be shortened. Active movements should be instituted as soon as the wound is healed. Under this method of treatment complete restoration of function will generally be obtained, though stiffness of the fingers and partial anaesthesia may persist for some time.

A. G. NICHOLLS

The Differences Between High and Low Intestinal Obstruction in the Dog. Morton, J. J., *Arch. Surg.* 18: 1119, No. 4, 1929.

It is a well known clinical fact that in intestinal obstruction the toxæmia which develops,

is more rapid in its onset if the obstruction occurs high up in the intestine. In order to explain this fact, a series of experiments was performed on dogs, obstruction being produced at two levels, namely, the lower duodenum and the terminal ileum. Following these experiments, it was concluded that a high obstruction is more provocative of toxæmia than a low obstruction, because of certain anatomical and physiological differences.

It was definitely shown that the duodenum has a much richer vascular supply than the ileum. Not only are the larger vessels more numerous but the capillary network in the duodenum is much more extensive. This permits a duodenal loop to take up and retain larger amounts of poison than a similar ileal loop.

The rate of fluid secretion was found to be much greater in the duodenum than in the ileum. This leads to a higher intra-enteric pressure. For this reason the possibility of pressure necrosis and perforation is much greater in the duodenum, although the bursting pressures of duodenum and ileum are practically equal.

The increased intra-enteric pressure squeezes out the retained toxins into the general circulation faster than the body can detoxify them.

The exact pathway of absorption of the toxins still remains a problem. The most accepted theory is as follows. There is first a latent period with no manifest symptoms. During this time fluid is secreted into the obstructed loop, and bacterial growth progresses. Histamine-like bodies are formed, and absorbed into the intestinal wall. The capillaries become distended and fluid escapes from them into the tissue spaces. The toxins are retained in the intestinal walls due to circulatory and lymphatic stasis until such time as the increased intra-enteric pressure forces them out into the systemic circulation.

This theory would explain the rapid toxæmia which develops following release of an obstructed strangulated segment of bowel. It also explains the bad results following too much handling of the oedematous obstructed bowel.

P. G. SILVER

OBSTETRICS AND GYNÆCOLOGY

Uteroinflation followed by Pregnancy in 205 Cases out of a Series of 2,000 Cases of Infertility. Rubin, I. C., *Am. J. Obst. & Gyn.* 17: 484, April 1929.

Rubin is a pioneer in connection with the attempt to diagnose, by means of the x-ray, obstruction in the Fallopian tubes in cases of sterility; and in the treatment of these cases by re-establishing the permeability of their lumina.

In this paper are given the results of his

experience. He had 2,000 cases of sterility, 1,070 being primary, and 930 secondary. By his method of treatment he obtained 205 gestations, with 188 accouchements at term, and 17 abortions. In addition, there were three ectopic pregnancies.

Twenty-seven per cent of the women were more than thirty years of age.

One hundred and fifty-two women out of the 205 became pregnant in the six months following insufflation. In 92 cases other measures were adopted in addition to insufflation, such as excitative irradiation. Insufflation should be practised, by preference, about the time of ovulation.

Rubin considers that, when a woman has been sterile for five years or longer, and then becomes pregnant in the month following insufflation, there must be some therapeutic merit in the procedure. At the same time, he points out that there are other factors in the etiology of sterility besides tubal obstruction. He, therefore, advocates a thorough examination of both husband and wife.

A. G. NICHOLLS

THERAPEUTICS

Colds and Asthma Associated with Colds. Preventive Treatment with Vaccines. Walker,

C., *Arch. Int. Med.* 43: 429, April 1929.

Asthmatic patients from whom sputum was not obtainable were treated with pooled streptococcal vaccine with beneficial results. This led to the treatment of patients with spasmodic asthma and colds with the pooled vaccine. Changes in prevalence of different varieties of streptococci seemed to occur during the warm season of the year; data were constant during the cool season. Not more than 4 of the 8 hæmolytic varieties of the streptococcus were prominent during any one period and not more than 5 of the 8 non-hæmolytic varieties.

In 1919 the pooled autogenous vaccine was replaced by a mixed streptococcus vaccine which consisted of equal parts of the streptococcus predominating for that period. Treatment consisted of weekly injections of 3 minims, the equivalent of three hundred million organisms. This dose was increased by one minim weekly for 8 to 10 weeks, given during the fall and early winter. The only cases presented are those who were under observation for four or more years. The ever present streptococcus cannot be prevented from invading the nose and throat of a person. If resistance is sufficient the organism will sooner or later be destroyed.

A total of 312 courses of vaccine were given to 97 patients. In 22 cases there was freedom from colds and asthma associated with colds for 6 months or less; in 28 freedom from 7 to 9

months; in 124 from 10 to 12 months; in 20 from 13 to 18 months; 13 were free for 2 years after one course; 5 were free for 3 or more years after one course.

Each fall the prevailing types of streptococci are different from those of the preceding year. If the vaccine is given in the fall its beneficial effects last for a year in most instances.

A few of the children who seemed to be protected from colds and measles, whooping cough, chicken-pox and scarlet fever. This is evidence that the symptoms of a common cold which precede these diseases are early symptoms of the disease itself rather than of a common cold which predisposes to the disease. This would seem to be true also of the few adults who had pneumonia and influenza.

LILLIAN A. CHASE

Le traitement de la névralgie faciale par le trichloréthylène. Busscher, R., *J. d. Neurol. et d. Psychiat.* 29: Feb. 1929.

The promising line of treatment for facial neuralgia detailed in this paper is based on certain observations of Plessner's (1915) relative to the cases of four workmen who had been poisoned with trichlorethylene, when the following effects were produced: vertigo, vomiting, slight œdema of the optic papilla, and anæsthesia of the sensory portion of the trigeminal nerve, without involvement of the motor branch or of the other cranial nerves.

In view of these facts, Busscher tried the effects of trichlorethylene (manufactured under the name of "chlorylene") in cases of neuralgia of the trigeminal nerve. German neurologists had reported good results in from 25 to 40 per cent of cases. The results are said to be best in persons of alcoholic proclivities, in recent neuralgias, and in the so-called "essential" type.

The reaction on the part of individuals is very variable, and the inferior maxillary branch is apparently less sensitive to the medication than are the other divisions.

The drug, which should be administered with great care, may be given by inhalation, 25 to 30 drops on gauze, three times a day; or by the mouth, by means of gelatine capsules containing 25 to 30 centigrams. The treatment may be needed for only a few days, or, again, may have to be continued for several months.

The author, reporting 31 cases, gives the following: 6 cases cured, rapidly and completely; 4 with remissions of from two weeks to six months; 3 cases partially relieved; and 18 failures.

A. G. NICHOLLS

Foam Therapy. Russell, W. Kerr, *Brit. J. Actinother. & Physiother.* 4: 34, May 1929.

A new form of treatment by means of specially prepared foam has been developed exten-

sively in Germany within recent months by Nagelschmidt and others. The first full account of this new idea published in Britain can be found in the May issue of the *British Journal of Actinotherapy and Physiotherapy*. This contains a complete description of the technique for preparing and using foam baths in their various forms. A special saponin is added to the water, and æration baths, sweating baths, carbon dioxide baths, and others can be obtained.

Foam, apparently, is of value for many local disorders. It is useful, for example, for the application of moist heat to painful joints, being very light and retaining its heat for prolonged periods; for cleansing the hair and scalp; for treating leucorrhœa and catarrhal vaginitis; for rectal and colonic irrigation in cases of constipation and various forms of colitis and enteritis; for urethritis; and for nasal catarrhs. Various medicaments can be added to the foam if desired. Apart from the mechanical effects of foam (stimulation, distension), mucus and cell debris are emulsified or dissolved. The foam particles are so small that they can enter pores and minute ducts, where they liberate their oxygen charge. In this connection it has been found by experiment that the oxygen penetrates at least one inch into the tissues.

This form of therapeusis appears to be at first sight, a bit "frothy," but there may very well be something in it; in any case, the article is worth reading for its clear presentation of a new line of treatment which has at least possibilities.

A. G. NICHOLLS

The Abuse of Drugs in Certain Psychopathic States with Reports of a Few Cases. Tillotson, K. J., *New Eng. J. Med.* 200: 999, May 9, 1929.

The use of sedative drugs in the borderline mental cases is not conducive to the best therapeutic results; the use of such drugs only adds more toxic material to an organism that is already overburdened with the toxins of an abnormal psychological and physiological activity brought about through worry, fatigue, exhaustion or infection. The prolonged employment of drugs to combat various symptoms, and the resulting inability to give the patients sufficient nourishment and elimination by fluids for a considerable period of time, depletes the physical condition of these patients so that when they finally arrive at hospital they are so toxic and physically exhausted that treatment is difficult.

The drug system of therapy, so far as sedative drugs is concerned, has no rightful place in the practice of psychiatry, and has been discredited at the McLean Hospital, Waverly, Mass., since the late 80's or early 90's.

Many of the borderline conditions could

advantageously be referred earlier to the mental hospital where under proper care and treatment, the acute delirious episodes could often be prevented.

The false opinion formerly entertained that mental diseases were irremedial checked the rational impulse of humanity. Frequently patients themselves remark that if they had been sent to the hospital months before they would have been spared a great deal of suffering.

The types in which drug deliria most commonly occur and in which the use of sedative drugs should be especially avoided are: (1) The psychasthenic personality; these persons are weak-willed, undecided, hesitating, timid, not combative, not able to take the world as it is, idealistic, longing for love and kindness; they are easily led or misled, they need stimulation and are apt to yield without decision, notwithstanding their usually superior intelligence and vivid imagination. (2) The neurasthenic personality; this term should be reserved for the cases combining the symptoms of great exhaustibility and irritability. (3) The hypochondriacal personality; these patients are troubled with vain fears over trifles; they consult quack literature and the various cults; the impressions of bodily disease are apt to dominate. (4) The constitutional psychopathic inferior; the patient varies alternately from exuberant joy to boundless desolation, from feverish activity to profound discouragement. (5) The cyclothymic or alternating personality; this differs from the above in degree with more marked periods of depression and exhilaration. These personality types should be recognized by physicians and the use of sedative and hypnotic drugs avoided.

Legal restriction of the sale of hypnotic drugs, except on a physician's prescription and the use of the chemical names of the drugs, as for instance, diethyl-barbituric acid instead of veronal, seems advisable. The early recognition of the bad personality traits and symptoms which constitute one of the several psychopathic states, and the early hospital care and treatment for such cases, are recommended.

LILLIAN A. CHASE

PATHOLOGY

Beitrag zur Frage der Innervation der Geschwulste. (Contribution to the Question of the Innervation of Tumours). Herzog, E., *Virch. Archiv.* 268: 536, 1928.

The author has examined about one hundred tumours of various kinds, both benign and malignant, including metastatic growths, for the purpose of detecting nerve filaments therein, if such exist. A modification of Bielschowsky's silver method was used.

The tumours examined included carcinoma, sarcoma, hypernephroma, glioma, endothelioma, adenofibroma, myoma, papilloma, polyps, and lymphogranuloma. In the majority of these, nerve fibres could be demonstrated in the stroma, provided that the new growths were not circumscribed or encapsulated, and that nerves were present normally in the tissues which they were invading. Nerve filaments were consistently absent in all strictly limited primary tumours, and no ingrowths of nerves from the periphery were demonstrated. The same was true of the metastatic growths. Signs of proliferation of embedded nerves were rarely noticed; the struc-

tures sometimes described as nerve-endings represent attempts at regeneration at the end of a nerve fibre. Some of the nerves found in tumours were medullated and some were non-medullated, probably nerves accompanying blood-vessels.

The author concludes that true neoplasms can grow without the influence of included nerves. He could not demonstrate the presence of specific trophic nerves in tumours. He thinks that the nerves accompanying vessels in the tissues of the host in close proximity to the growth undoubtedly exert an influence, but that there are no intrinsic specific nerves.

A. G. NICHOLLS

Obituaries

Dr. A. MacKenzie Forbes died suddenly on the morning of May 16th at his home in Montreal. He had been ill for several weeks and confined to his house with myocarditis but the sudden end was unexpected.

Dr. Forbes was born in Montreal 55 years ago, and was educated at the Montreal High School and McGill University. He graduated with honours in Medicine in 1898. After an internship at the Hospital for Ruptured and Crippled in New York, he started practice in Montreal and was shortly after appointed assistant surgeon to the Montreal General Hospital and Demonstrator of Anatomy at McGill University. From the time of his graduation he was especially interested in orthopaedic surgery. He spent much time in the study of his specialty making numerous visits to the orthopaedic centres in America and Europe and gradually acquired an international reputation as an authority and original investigator in his chosen subject. He was appointed Fellow of the American Orthopaedic Association and later President of that body. He was appointed Clinical Professor of Orthopaedic Surgery at McGill University, and was the author of numerous original articles on orthopaedics. At the time of his death he was President of the Montreal Medico-Chirurgical Society.

At the outbreak of the Great War he immediately volunteered his services and was sent to Valcartier Camp in the autumn of 1914, to go overseas with the 1st Canadian Contingent. After the winter at Salisbury Plains he went to France as one of the surgeons of the 1st Canadian General Hospital. He continued his services until obliged to return to carry out his duties in Montreal hospitals.

When the Montreal unit of the series of Shriners'

Hospitals for Crippled Children was founded in Montreal, Dr. Forbes was appointed Surgeon-in-Chief of the unit, which position he held until his death.

However, it was by his work in connection with the Children's Memorial Hospital of Montreal that Dr. Forbes was best known, and this group of buildings remains a wonderful memorial to his personality, energy and devotion. As a young practitioner he conceived the idea of starting a separate hospital for

children in Montreal. Through his enthusiasm and untiring energy he was able to interest others and open the institution in a rented house on Guy Street. In the face of many difficulties and discouragements he persisted in his plans until the institution was established and the present buildings constructed on Cedar Avenue. Realizing the handicap in the lack of education for disabled children, he later founded the Montreal School for Crippled Children, the first of its kind in Canada and one of the largest and best organized in America.

As a man Dr. Forbes was always a leader in any enterprise with which he was associated. A tireless worker, staunch and persevering in his purpose, he was able to accomplish almost impossible tasks with little or no assistance. He was a true and loyal friend and greatly beloved by many. Above all he was devoted to children and it was a pleasure to see the happiness and actual hero-worship of his many little patients in his hospitals. He was always

original in his ideas and his teaching clinics were a great delight to the students. By his death Canada has lost a great citizen and his profession a truly great surgeon and teacher.

H. B. CRISHING



Dr. A. MacKenzie Forbes

Dr. Angus MacKinnon died in Guelph on June 4, 1929. He was born on June 30, 1846. He was a Past-president of the Ontario Medical Association, having held the position of President in the year 1900, and was also a life member of the Ontario Medical Association.

AN APPRECIATION

With the death of Dr. Angus MacKinnon, of Guelph, Canadian medicine has lost an outstanding practitioner of the old school. Engaged in the practice of medicine since 1871, fifty years of which he spent in Guelph, few men have left, or can leave, behind them such a record of honest work as he has done. He was an example of the all-round practitioner. An able physician, he did a large amount of surgery and did it well, but in obstetrics he was particularly brilliant. Guelph was fortunate in having two such practitioners as Angus MacKinnon and Henry Howitt. Both were alert to the newer developments, and as good surgery was done in the Guelph General Hospital forty years ago as anywhere. There was no elaborate equipment, but the importance of asepsis and antisepsis was recognized.

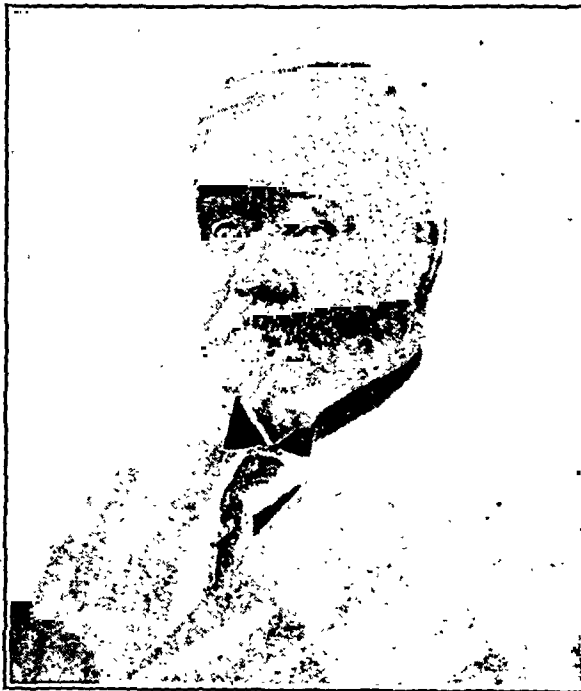
Of Highland ancestry, Dr. MacKinnon had the active temper that often goes with that heritage, but with it much of Lowland caution and steadiness. Few men have a higher idea of what the conduct of the medical profession should be than he had. His ideals of professional conduct were unusual, and when a brother practitioner failed to observe the usual decencies of conduct, his feeling was more of sorrow that such things could be in a learned profession than the indignation which most of us would feel. He felt that any conduct other than the most exemplary was a blot on the honour of the whole profession.

The days of preceptor and student have gone almost entirely and this must be regretted. I count myself fortunate to have had him as a preceptor during three summer vacations and one could not have had a kinder one. The student learned to make up prescriptions, and absorbed a knowledge of materia medica and dosage in doing it. Whenever possible, the opportunity was given to do many of the minor things which many students never have any chance to do. There was much discussion of the daily problems and the constant effort to make the student think out matters for himself. The importance of the patient as a human being, the wisdom of understanding his peculiarities, and the need of knowing human nature, were always being emphasized. For his judgment I soon learned to have a profound admiration. His example and the training received from him have been important factors in my life. There are very few of his generation left, and the days have gone to a large extent when a man practised the healing art in so many ways. The younger generation may wonder that the same man might remove a cataract to-day and a prostate to-morrow. Angus MacKinnon did both well. He was one of the pioneers in Ontario in doing the operation for removal of the prostate. My memory brings back operations done by him in the country under all sorts of difficult conditions. Calls

often came to go considerable distances without any clear indication of what was waiting. It might be a serious emergency demanding immediate operation with few facilities and very little help. His courage and skill had ample chance for demonstration. It was a good school for a medical student.

Honest, kind, always anxious to learn, straightforward in his dealings with patients and others of the profession, his passing means that another of the men who fought to do the best for their patients in the earlier days, when facilities were scarce and the difficulties greater, has gone. Medicine has developed along many lines, but the character of the best practitioners is after all the same in all stages of the history of our art. Stevenson's eulogy of the profession was fully earned by Angus MacKinnon.

THOMAS McCRAE



Dr. Angus MacKinnon

Harry M. Andison, M.D.

In the recent disastrous explosion and fire at the Cleveland Clinic Hospital, Dr. Harry Martin Andison of the hospital staff was one of the victims. He was the son of Mr. and Mrs. Augustus Andison, of 191 Sherbrooke Street, Winnipeg. Born in Winnipeg twenty-nine years ago, he was educated in the public schools and Kelvin Technical High School. After a brilliant course in the medical faculty of the University of Manitoba, he graduated in 1924 and was

interne at the Children's Hospital, Winnipeg, Royal Jubilee Hospital, Victoria, B.C., and Manitoba Sanatorium, Ninette, before proceeding to Cleveland. He married Miss Currier, of Vancouver, a graduate of the Winnipeg General Hospital Training School. His funeral was held on May 20th, in the First Presbyterian Church, Winnipeg, and interment was in Brookside Cemetery.

In addition to his widow and parents he is survived by three brothers, Dr. Gordon Andison, Professor of French at Toronto University; George, of Toronto; Alexander, of Winnipeg, and one sister.

Dr. Andison's tragic death cut short a career of the utmost promise.

Dr. William H. Alexander died on May 7th at his home in Toronto, aged 67. A general breakdown in health caused him to relinquish practice a few months ago. He was born in Bolton, and was educated there and at the Toronto Model School. Before taking up the study of medicine he taught school in King Township. He graduated from Trinity College in 1894 and commenced practice in Toronto. He was formerly in the Queen's Own Rifles, and served with the late Gen. Sir William Otter in the suppression of the Northwest Rebellion. He was a member of St. Peter's Anglican Church. Surviving are his wife, formerly Miss Edith Laird; two brothers, Ernest, Toronto, and John, of Los Angeles; and two sisters, Miss Margaret and Mrs. W. G. Beamish, Toronto.

Dr. E. L. Connor, of Lethbridge, Alberta, who died on May 14th at the age of 48, was one of the outstanding members of the active surgical group of southern Alberta. Quantity was not his forte, but quality. Many of the cruder operations he hesitated to do, but those requiring very well balanced judg-

ment and the interpretation of obscure symptoms appealed to him at once and would receive his earnest attention. Nothing was too much trouble in preparation or in meeting difficulties which arose, but routine was apt to be irksome.

His ability and clear thinking combined with an exceedingly good memory for conditions and processes were acknowledged by all his confrères, who mourn his early demise.

He was a graduate of McGill University and spent some time abroad on different occasions, in addition to studying in American centres. He practised for several years at Pincher Creek before coming to Lethbridge. A Fellow of the American College of Surgeons, he was an ardent advocate of more thorough diagnosis and other features of their standardization program. His funeral from St. Patrick's Church was largely attended by his confrères and former patients.

W. S. GALBRAITH

R. U. Jeffery, M.D. Following a very short attack of broncho-pneumonia Dr. R. U. Jeffery died on May 2nd at his brother's home in Seattle whither he had gone to recuperate after influenza. The son of Ven. Archdeacon and Mrs. Jeffery of Winnipeg, he graduated from the Medical Faculty of the University of Manitoba in 1925. During his college course he distinguished himself as a student, winning one of the Chown medals and prize. After a trip to the Orient he began practice at Sumas, Wash. Later, he engaged in practice at Carberry, Manitoba, but finding the climate too severe, he returned to the Pacific Coast and became physician in a mental hospital at Essendale, B.C.

The funeral took place on May 9th from Holy Trinity Church, Winnipeg, to St. John's cemetery. His death cuts short a career of much promise and removes from us a young man of attractive personality.

Dr. P. R. E. LeSage. The death occurred on May 11th, at his home in Longueuil, Que., of Dr. P. R. E. LeSage.

Dr. Roy H. McGrath, of Fredericton, N.B., died in the Victoria General Hospital there, on May 23rd, aged fifty-one years, following a severe heart attack. His illness began with influenza in January last. Dr. McGrath was a native of Moncton and a graduate of St. Joseph's University and McGill Medical School. After graduating, he located in Fredericton and practised there until his death. Dr. McGrath was a member of the staff of the Victoria Hospital and had

previously been a member of the Board of Health. He was a member of the Knights of Columbus and of the Fredericton City Club.

Dr. S. W. Otton, a well known medical man in Newmarket, Ont., was found dead in his home on May 19th. He had been in poor health for some time, but his end came as a great shock to his family and many friends. Dr. Otton served in Franco from 1916 to 1919, holding the rank of captain in the C.A.M.C. He is survived by his widow and two small sons.

Dr. William A. Proctor, of Toronto, some years ago a well-known athlete in the west end, died on May 19th in the Hospital for Incurables. He was 54 years of age, and had been an invalid for many years.

Dr. W. J. Shipley, a prominent physician of Calgary, died at his home during the latter part of April, after an illness extending over several months.

Dr. Shipley was born in Clinton, Ontario, where he received his early education. Proceeding to Western University at London, Ontario, he graduated from this institution in medicine in 1906. Coming west at this latter date, he spent a year as interne in the Brett Sanatorium at Banff, Alberta. In 1907 he entered on the practice of his profession at Calgary, where he remained until the time of his death.

Never of a robust constitution he frequently sought change of environment for the benefit of his health. Last December he was afflicted with a serious illness, but made a partial recovery and spent some time at Victoria, B.C., in search of health. He returned home, however, wholly unbenefited from his sojourn at the coast. He passed away unexpectedly.

Those who were intimate with him will ever remember his kindly genial nature and the ease with which he made friends. During the year 1918 he was President of the Calgary Medical Society, in which organization he always took a keen interest. He leaves a widow and three sons. His brother W. Mills Shipley, of Calgary, also survives him.

G. E. LEARMONTH

Dr. J. Newton Smith, or Hampton, N.B., died on May 9th, in the eighty-fourth year of his age, following a prolonged illness. Dr. Smith practised his profession for the last forty-eight years in Hampton. He was born at Smithtown on June 29, 1855. He received his education at the Hampton public schools, Fredericton normal school, and graduated in medicine from the University of the City of New York in 1881.

News Items

BRITISH EMPIRE

The Garton Prize and Medal

This prize and medal has been instituted by the Grand Council of the British Empire Cancer Campaign with the object of promoting investigations into the nature, causes, prevention and treatment of cancer.

A medal (suitably inscribed and engraved with the seal and motto of the Campaign), together with an honorarium of £500, will be awarded to the person, or group of persons, who shall submit the essay embodying the results of original investigations which, in the opinion of the Judges appointed by the Grand Council of the British Empire Cancer Campaign, is the best contribution towards the early diagnosis of cancer.

In the event of several dissertations of sufficient merit being submitted, the prize may be divided, or additional awards made.

The prize will be reserved if, in the opinion of the Council, no dissertation of sufficient merit be received.

Candidates, who may be of either sex, must be *British subjects domiciled in the British Empire or Dominions* and not at the time members of the Grand Council of the British Empire Cancer Campaign.

The honorarium may be awarded either to an individual or to a group of persons who jointly submit a dissertation.

The dissertations shall be printed or typewritten in English, and embody the results of original investigations carried out, either wholly or in part, during the three years immediately preceding the year in which the prize shall be awarded.

The dissertations shall not bear the name of the author or authors, but shall be distinguished by a motto or device; and be accompanied by a sealed envelope containing the name and address of the author, and having on the outside the motto and device corresponding with that on the dissertation.

The dissertations shall be addressed to the Honorary Secretary, British Empire Cancer Campaign, 19 Berkeley Street, London, W.1, and be delivered not later than December 31st, 1931.

The prize dissertation (with all accompanying illustrations and preparations) shall become the property of the British Empire Cancer Campaign, and shall be published at their discretion under the name of the author or authors.

Dissertations not approved for a prize shall, upon authenticated application within three years of the award on the specified subject, be returned together with the unopened envelopes containing the names and addresses of the authors.

The award of the Garton Prize and Medal will be made early in 1932.

Native Medical Practitioners in Fiji

Suva, the centre of the South Pacific, has had a system of training native medical practitioners, but by the aid of the Rockefeller Institute this system is to be developed and extended. The problem of giving medical aid to native populations is one of method and of finance.

The annual expenditure of training native doctors for Fiji and the islands in the vicinity is likely to be about £3,300; the cost of the buildings and plant is £3,000. A tutor who came from Aberdeen University has been appointed, and will take charge of the main part of the practical teaching, and Government medical men and resident scientific officers will take charge of the more specialized teaching. The course is a three-year one, and forty students, chosen by competitive examination, and young men of high intelligence and good physique, will be trained without cost to their parents. When their training is complete they will be sent to various districts and given a salary ranging from £45 to £150 a year. They also will be given quarters, and, where there is no fully qualified doctor, will be allowed the right of private practice. When the scheme has developed arrangements will be made for post-graduate training.

Dr. William B. H. Massiah

Dr. William B. H. Massiah has been appointed a member of the Legislative Council of the Island of Barbados. He is a graduate in medicine of McGill University (1892).

GREAT BRITAIN

A National Radium Fund

On April 16th the Chancellor of the Exchequer announced that the Government had undertaken to contribute out of public money towards the purchase of radium, on a basis of £1 for every £1 otherwise subscribed, up to a limit of £100,000. A public appeal for £150,000 (making £250,000 in all) to form a "National Radium Fund" has now been set on foot by leaders of the medical profession acting in concert with laymen prominently associated with the work of hospitals and cancer research. The purpose and scope of the fund were indicated in a letter published in the *Times* of April 29th, over the signatures of Sir John Rose Bradford, Lord Moynihan, Lady Barrett, Sir E. Farquhar Buzzard, Lord Dawson of Penn, Dr. Robert A. Fleming, Lord Gorell, Sir Thomas Horder, Lord Knutsford, Mr. J. P. Lockhart-Mummery, Sir Ewen J. Maclean, Dr. J. M. H. MacLeod, Mr. Alexander Miles, Lord Reading, Sir Humphry Rolleston, Sir Arthur Stanley, Lord Stanmore, Sir StClair Thomson, and Sir John Bland-Sutton.

The money obtained in this way, together with that contributed by the Government, is to be held by a body known as the National Radium Trustees, who will buy therewith and hold radium for use by an administrative body of experts known as the National Radium Commission. The Trustees are being constituted by the Government in accordance with one of the recommendations made by the Radium Sub-committee of the Committee of Civil Research, but with two additional medical members to be nominated from their own number by the Radium Commission. The composition of the latter body has been modified so as to ensure adequate representation upon it of those familiar with the use of radium in medical practice, and its membership has been increased from nine to eleven. The Commission will thus consist of a chairman, appointed by the Trustees; six members, appointed by the Trustees from a list of names drawn up by the titular heads of the medical profession; and four members nominated respectively by the Minister of Health, the Secretary of State for Scotland, the Medical Research Council, and the Department of Scientific and Industrial Research. The general effect of these changes in the administrative framework of the scheme put forward by the Radium Subcommittee is summed up in the letter published on April 29th: "The radium will be bought and held by a body of Trustees which has the confidence alike of His Majesty's Government and

the medical profession. It will be administered by a Commission which will contain an effective majority of members representing the skilled and experienced workers on the staffs of the voluntary hospitals."—*Brit. M. J.* 1: S20, May 4, 1929.

The following week the *British Medical Journal* referred to the matter as follows: "It is gratifying to note that the National Radium Fund, for which an appeal had been launched in the *Times* of April 29th, was already over-subscribed on May 6th. The appeal for £150,000, the amount required for the National Radium Fund, was being made conjointly with a special appeal by King Edward's Hospital Fund in aid of the hospitals in the metropolitan area, as a thank-offering for the King's recovery, the latter project having for its nucleus the 100,000 guineas offered by an anonymous donor. The treasurer of the combined appeal is Lord Donoughmore, and its two branches, sharing a common office organization, have been administered throughout in the closest co-operation. Lord Donoughmore, in a letter to the press dated May 4th, has indicated that, the money required for the National Radium Fund having been subscribed, all connected with King Edward's Hospital Fund would wish that the needs of hospitals outside the metropolitan area should be more directly associated with the Thank-offering Fund.

In a letter to the *Times*, published on May 2nd, the Prime Minister expressed, on behalf of His Majesty's Government, the deep gratification with which they had seen the swift and spontaneous response of the public to the opportunity of manifesting its relief at the lifting of the shadow which lay over the country during the King's illness. With the £152,779 already in the National Radium Fund, and the Government's contribution of £100,000, practical steps could be taken to bring the benefit of radium treatment to many who would otherwise have waited for it in vain."—*Brit. M. J.* 1: S65, May 11, 1929.

Katherine Bishop Harman Prize for Encouragement of Research into Disorders Incident to Maternity.

The Council of the British Medical Association is prepared to consider an award of the Katherine Bishop Harman Prize in the year 1930. The value of the prize is £80. Its purpose is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy

and child-bearing. Competitors are left free to select the work they wish to present, provided the work falls within the scope of the prize. Any medical practitioner registered in the British Empire is eligible to compete for the prize. Should the Council of the Association decide that no essay is of sufficient merit the prize will not be awarded in 1930, but will be offered in the year following this decision, and in this event the money value of the prize on the occasion in question will be such proportion of the accumulated income as the Council shall determine. The decision of the Council will be final. Each essay must be typewritten or printed in the English language, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto and enclosing the candidate's name and address. Essays must be forwarded so as to reach the Medical Secretary, British Medical Association House, Tavistock Square, London, W.C.1, not later than December 31, 1929. Inquiries relative to the prize should also be addressed to the Medical Secretary as above.

The Poet Laureate

Among those upon whom the University of Cambridge conferred honorary degrees at a special congregation on June 4th, was the Poet Laureate, Dr. Robert Bridges, F.R.C.P.

Lord Beaverbrook's Gift to Charity

In celebration of his fiftieth birthday anniversary it was announced in London on May 25th that Lord Beaverbrook, noted Canadian newspaper proprietor of Great Britain, would donate a total of \$315,000 to charity in seven yearly instalments.

Forty-five thousand dollars of this amount will be given to the St. Mary's Hospital Medical School, Paddington, London.

Burroughs and Wellcome's Exhibition

Messrs. Burroughs Wellcome and Company's west end exhibition rooms have been transferred from 54, Wigmore Street to more commodious premises at 10, Henrietta Street, Cavendish Square, W.1. Members of the medical and allied professions are invited to inspect the exhibits, which are on view daily from 9 a.m. to 6 p.m.; Saturdays, 9 a.m. to 1 p.m.

NOVA SCOTIA

At the annual meeting of the Halifax Branch of the Medical Society of Nova Scotia, Dr. J. R. Corston was elected President for the ensuing term, and Dr. J. N. Lyons was elected Vice-president. Dr. N. H. Gosse was elected to the secretaryship.

Members of the "old school," who look back affectionately upon the days of the Halifax Medical College, cannot but feel a sense of regret at the demolition of the old college building, which has been razed to make room for the construction of residences.

The Halifax profession took advantage of an opportunity to honour Dr. George D. Stewart by tendering him a complimentary dinner on the eve of the Dalhousie Convocation. The dinner was held at the club house of the Halifax Golf and Country Club, Ashburn, and proved to be most enjoyable.

Dr. Haywood, Montreal, and Dr. Galbraith, Toronto, have recently completed an exhaustive survey of the Aberdeen Hospital, New Glasgow. Their visit followed shortly upon the distressing Cleveland hospital disaster, and their suggestion that x-ray films of inflammable type should be removed from the

A Memorial to Sir Clifford Allbutt

A bronze bas-relief portrait in profile of the late Rt. Hon. Sir Thomas Clifford Allbutt, K.C.B., M.D., F.R.S., from 1893 to 1925 Regius Professor of Physic in Cambridge University, has been placed in the Allbutt Library of the Cambridge Medical School. The tablet is the gift of Lady Allbutt and was unveiled on May 18th by Sir James Crichton-Browne.

A Special Mission to Australia

The Prime Minister of the Commonwealth of Australia has, through the Secretary of State for the Dominions, requested the Minister of Health to liberate Dame Janet Campbell, the Senior Medical Officer for Maternity and Child Welfare at the Ministry of Health, to proceed to Australia in order to advise the Government on the organization and development of maternity and child welfare services for the benefit of the several States of the Commonwealth.

In view of the special importance of these services in the interests of the Empire as a whole, the Minister has acceded to the request and has agreed to set Dame Janet Campbell free from her official duties in this country for a limited time. She will probably leave England on this special mission towards the end of July.

The recognition bestowed on the physicians, surgeons, and specialists who attended the King with such untiring devotion during his Majesty's illness will be welcomed by the whole Empire. Lord Dawson of Penn is made a Privy Councillor; Sir E. F. Buzzard and Sir Hugh Rigby are created baronets; Dr. R. S. Woods, of the London Hospital, is knighted; Sir Frederick Stanley Hewett is made K.C.B.; Sir Humphry Rolleston becomes G.C.V.O., Dr. F. E. Shipway, K.C.V.O., and Mr. H. K. Graham Hodgson, Dr. F. D. Howitt, and Dr. L. E. Howard Whitby, M.C., are made C.V.O.; Dr. E. C. Dodds, Professor of Bio-Chemistry at London University, who was called in early this year, is made M.V.O.

The nurses, Miss Catherine Black and Miss Rosina Davies, of the London Hospital, Miss Elizabeth Adam Gordon, and Miss Nettie May Purdie are made M.B.E. for services during the King's recent illness.

Aberdeen Hospital to an adjoining building was followed by immediate action. The receipt of their full report is awaited with interest.

The announcement of an advance in the rates charged to patients of the Nova Scotia Sanatorium brought forth a memorial from the patients in protest against the increased charge. The Minister has, in consequence, decided to postpone application of the new rate for two months, and meantime an investigation is to be made in the hope of finding a means of continuing the present rate. Many are of the opinion that an advance would be regrettable, and that a revision of rates, should, in the interest of the public health, be downward rather than upward. Unfortunately, an attempt is being made to attach political significance to the proposed change, so that the discussion is not quite dispassionate and is not entirely in the interest of the unfortunate victims of our most devastating disease.

The twenty-sixth of May proved rather disastrous to the motor cars of several Nova Scotia physicians. Dr. Johnston, of Great Village, and Dr. McCurdy, of Truro, were both summoned to attend victims of a

motor accident, and in their rush to the scene of accident became involved in a head-on collision, which fortunately caused no injury to either doctor but seriously damaged both cars. On the same day, Dr. Wickwire, of Liverpool, on responding to an emergency call, found that he lacked some necessary materials and directed a messenger to take his car and go to his office for the things needed. The messenger miscalculated a turn in the road and went over an embankment with serious results to the car.

A few weeks ago Dr. O. S. Gibbs, of the Dalhousie Medical School, reported some of his experimental work in pharmacology to the Nova Scotian Institute of Science. As a drug which he was studying affected the heart in such manner as to interfere with his experiments, he removed the heart of a cat, substituted a rubber heart which was motivated by electricity, and kept the animal alive for several hours. The newspapers learned of the experiment and seized upon the dramatic element—the artificial heart—for a “feature.” They gravely submitted that bad human hearts cannot yet be replaced with artificial organs. Of course, correspondents have expressed much shock at the inhuman treatment of cats. And there has apparently been general failure to realize that Dr. Gibbs’ ingenuity opens up a means for the investigation of the action of drugs which may prove to be of very great value.

When Laennec gave the stethoscope to the world, it is quite unlikely that he had any conception that it would be utilized in the location of a distressed kitten. But the story comes from Glace Bay that a kitten’s curiosity might have led to its untimely demise had Laennec not lived. The kitten contrived to get into the wall of a warehouse, but seemingly forgot the combination and failed to come back. It announced its plight to all who would listen, but none could be sure of just where it was. As the proprietor of the warehouse had little ambition to have unnecessary holes made in his wall, he welcomed the suggestion that a doctor’s stethoscope be brought to the aid of the rescue party. In the skilled ears of an inspector of wiring, the instrument proved worthy of the confidence reposed in it. Kitty was located with great exactness, only one hole had to be made to extricate her, and a mother cat *et alia* were relieved of much anxiety.

Dr. R. M. Benvie has returned to Stellarton after a long period at travel and graduate work in England and on the continent.

Dr. I. M. Lovitt, of Yarmouth, signaled his recent return from an extended visit to South Africa by endowing the Digby Hospital in the sum of five thousand dollars.

W. H. HATTIE

NEW BRUNSWICK

On May 17th, the City Council of Moncton approved the plans of the new addition to the City Hospital. The Council guaranteed bonds to the extent of \$150,000.00. The addition with the new heating plant will cost \$275,000.00.

The various training schools of the province have, in the past month, held their graduating exercises. At St. Stephen, Dr. E. V. Sullivan addressed the graduating class. At Moncton, Dr. George Lyons was the medical speaker, and at Saint John, Col. M. MacLaren, M.P., M.D., and Dr. W. W. White were the speakers.

At the Convention of the National Council of Women, held in Saskatoon, on May 28th, Dr. Mabel Hanington, of Saint John, spoke on the subject of Mental Hygiene.

A reminder of war-time days appeared as a news item in the press recently, when it was announced that Mrs. Maude B. Duval, Montreal, widow of Dr. Joseph A. Duval, formerly of Saint John, N.B., had been awarded compensation in part payment for expenses arising out of the extraordinary chain of untoward circumstances following her husband’s death. Among these circumstances was the fact that Mrs. Duval was a passenger on the ill-fated *Hesperian* when this vessel was torpedoed. Dr. Duval’s body was lost in this maritime tragedy.

On June 4th, a conference of the Catholic Hospitals Association, of the Maritimes was convened in Moncton, with a very large attendance of nursing sisters, clergy and physicians. Chief among the medical items was a discussion led by Dr. H. L. Abramson, Provincial Path-

ologist, who dealt in a comprehensive manner with the relationships of pathological and bacteriological laboratory work to the functions of the hospital.

The May meeting of the New Brunswick Bureau of Health was held in Saint John under the chairmanship of Dr. G. G. Melvin, Chief Medical Health Officer, who presided in the absence of the Honorable Dr. H. I. Taylor. The success of the recent immunization clinics for the prevention of diphtheria was stressed, and it was announced that Dr. G. F. Jackson, of Winnipeg, was now in the province to learn at first hand the methods and results of this campaign.

Dr. B. H. Dougan, M.L.A., of Harvey Station, figured prominently in the sporting news recently, when it was announced that he had been successful in landing a five and one-half pound trout from Harvey Lake on Victoria Bay. This, to date, sets a record for medical anglers in New Brunswick for this year.

The delegation from New Brunswick to the Canadian Medical Association meeting was, as was expected, larger than usual. The number proceeding by motor was considerable.

Dr. and Mrs. Frank Stevenson, of Saint John, spent two weeks recently in New York.

Dr. L. G. Pinault was in attendance at the International Rotary Convention at Dallas, Texas.

Dr. C. G. Main, of West St. John, was recently elected President of the Carleton Branch of the British Empire Service Legion.

A. STANLEY KIRKLAND.

QUEBEC

Letters patent have been signed by His Honour Lieutenant-Governor Carroll incorporating the new 500-bed hospital which the University of Montreal will build on the slopes of the Mountain in the near future. The hospital will be designated as "L'Hôpital Universitaire de Montréal Incorporé." The aim of the corporation, which will have governors distinct from those who govern the university itself, is to maintain and administer a hospital with its branches and annexes where the sick, without distinction of faith or nationality, will be received and treated, and to promote interest in medicine and scientific research.

Valuable information and data for the benefit of the health units now operating in the Province of Quebec are being collected by Dr. Alphonse Lessard, Director of the Quebec Provincial Bureau of Health at various institutions in the United States. Dr. Lessard is now at the Rockefeller Institute of New York. The health unit system, now operating in the province, and known as County Health units, consists of the establishment in a county, or in two small neighbouring counties, of what might be called a bureau of health in miniature. The unit is composed of a full-time medical officer, two or more public health nurses, a sanitary inspector charged with the enforcement of health regulations and with the education of the municipal officers, together with a secretary to handle clerical work of the office, which is generally located in the principal town of the county. The whole population of the country is thus submitted to constant supervision. There are now eight of these units functioning in the province. Four more are soon to be in operation. In the counties where health units have been in operation for a period of two or three years, the general death rate has been reduced and especially the infant mortality rate and the death rate from contagious and infectious diseases, with also a marked reduction in the number of cases, this being largely due to better education of the public, immediate control of epidemics, free distribution of serums and vaccines, and free ambulant clinics for tuberculosis and child welfare.

The foundation of a Jewish general and maternity hospital is assured before another year, it was stated at a meeting held at the Baron de Hirsch Institute recently, when it was decided to institute a drive to raise the necessary funds to develop the project. A committee was named and plans laid to advance this adjunct to Hebrew life in the city of Montreal. A sum of \$500,000 is needed. Of this amount about \$100,000 has already been raised. The Jewish Loan Syndicates have pledged about \$35,000. An additional \$20,000 is forthcoming from the members of the Montreal Clinical Society and \$10,000 from the Sir Herbert Samuel Hospital; in addition a government grant of \$200,000 may be expected from the province, and a balance of \$135,000 would be asked for in the drive.

The increase in the toll levied among the citizens of Montreal by diphtheria, and a deficit of \$14,840 in the operating expenses of Alexandra Hospital were features of the report submitted by Dr. A. D. Blackader at the annual meeting of that institution, held recently. Scarlet fever cases of a severe type were also cared for in large numbers. The mortality rate of diphtheria rose from 6.8 per cent in 1926 to 8.26 in 1927, and to 10.4 per cent during 1928. Dr. Blackader called attention to the fact that the increase in the severity of type of diphtheria occurred in Great Britain and

other European countries in the United States as well as in Canada. Dr. Blackader reminded those present at the meeting that the Alexandra Hospital of to-day is practically the same size as it was twenty years ago when Montreal had only half of its present number of inhabitants. An additional pavilion is very badly needed, as numerous requests for beds have to be refused by the superintendent. During the past year 875 cases of scarlet fever were admitted of which twelve died. There were 118 cases of measles admitted, of which three died; 83 cases of erysipelas, of which eight died; five cases of whooping cough; seven of mumps; eleven of chickenpox; and one of smallpox; all requiring special isolation. Considering the severe types of the diseases treated during the year, Dr. Blackader said that the staff should be congratulated for keeping the mortality rate so low, for out of 1,599 patients received there were only 72 deaths, and of these 34 were moribund on admission.

The valuable work that is being done at the hospital erected and maintained by the Kiwanis Club of Montreal at the Shawbridge Boys' Farm and Training School was emphasized in the report presented to the special meeting of the administrative committee of the school, held under the chairmanship of Mr. John McMillan. Not only is the hospital used for the treatment of cases of illness, but with the equipment provided and the voluntary services of medical men from Montreal every boy in the school is submitted to examination by a psychiatrist, while such matters as vaccination, dentistry, and blood tests, are carried out at the Kiwanis Hospital. During last year there were 220 admissions to the hospital, and, despite the fact that some of the cases were serious, requiring night and day nursing, not a single death was recorded. The out-patient treatments for the year numbered 2,049. Fifty-nine new boys passed through hospital for examinations, while 85 dental treatments were given by Dr. Blacklock and 59 blood tests made by Dr. Anderson, who also vaccinated 24 boys. Other boys diagnosed and sent to the Royal Victoria Hospital for special treatment numbered 38. Members of the committee expressed their appreciation of the valuable adjunct the Kiwanis Hospital is to the school. Financial reports were submitted for the first three months of the year and showed continued improvement in the financial condition of the institution, which is now being administered on a budget system.

The Provincial Government will give hundreds of thousands of dollars to enable the Lake Edward Sanatorium and the Laval Hospital to add 100 beds to the number they already possess. While this interesting piece of news was given out some time ago by Premier Taschereau, Dr. Alphonse Lessard, who is in charge of the provincial health work, stated recently that work had already started on the Lake Edward "San." A new wing is being built here to accommodate 100 beds and it is hoped to have the work completed for the autumn. The new wing will be fireproof. At the same time the present wing is being remodelled. When everything is completed, the sanatorium will have a 200 beds capacity, instead of 100, as at present. Laval Hospital will soon have its work started on the extra beds.

At a meeting of the Joint Hospital Committee of the Montreal General and Western Hospitals, it was decided that considerable extension would be made to these two hospitals. It is believed that something like \$1,500,000 will be spent on this work. Definite in-

formation as to the plans in view, however, is not yet available. Col. Herbert Molson, chairman of the committee, when asked for details of the proposed extensions, said that nothing definite had yet been decided, but that it was probable that something along the lines of extension would be done.

The urgent need for larger accommodation was stressed at the annual meeting in the St. Mary's Memorial Hospital. It was announced that 900 patients were admitted to the hospital during the year ending December, 1928. The financial statement showed that expenditure for the year amounted to \$49,056, with receipts of \$33,726, leaving a deficit of \$16,581. It was shown that 831 patients were discharged of the 934 treated; 591 were Canadians, and 300 foreigners; 265 were Protestants, 654 were Catholics, and 15 were Jews, while there were 17 of other denominations. The daily average of patients was 34. Dr. J. L. D. Mason, Chief Medical Officer, showed that there was an increase of two over the previous year, or 285 patients in all.

Much improvement in health conditions in the Province of Quebec is shown in the February report of the Provincial Bureau of Health, just to hand. The report, while preliminary, shows that the mortality rate dropped back to normal, deaths due to influenza and pneumonia having fallen off. An indication of what this epidemic exacts in the province is given by the figures, showing that of 2,935 deaths in February 614 were due to the two causes mentioned, making a specific death rate of 287.94. The comment of the Bureau is that "In its whole, this preliminary report is relatively favourable, if it is considered that the month dealt with had only 28 days and that it registered the end of the above mentioned epidemic.

Its birth rate is actually low, but this rate will increase when all reports are at hand. Its marriage rate is lowering on account of the fact that more than half the month is included in Lent. Its infant mortality, with its rate of 133.1 per 1,000 living births, shows a good decrease over January, during which it was 172.9. The February rate of infant mortality will also decrease slightly when all birth reports are received."

Gerard Gardner, B.A., Sc.D., of the University of Montreal, who has already made discoveries both here and at the Institut Pasteur, Paris on micro-organisms, is leaving shortly for Paris, to continue there the research work undertaken by G. Buchanan on the germ of infectious jaundice. Dr. Gardner has already found the germ in rats and he is interested in its relations with tuberculosis. The principal aim of his work this year, while in Paris, will be to try to obtain pure cultures of a new spirochaete he has discovered in hay.

GEORGE HALL

Dr. Arthur Vallée, Professor of Pathological Anatomy and of Bacteriology at Laval University has just been elected a Fellow of the Royal Society of Canada in Section ii, that of French History and Literature. Dr. Vallée is the author of "Causeries" and "Michel Sarrazin." The latter notable work was discussed at length by Dr. Maude Abbott in our pages some months ago (*Canad. M. Ass. J.* 19: 600, Nov. 1928).

Drs. A. H. Desloges, Medical Director of Hospitals for the Insane, Reform and Industrial Schools of the Province of Quebec; Drs. Salluste Roy, Professor at Laval University, Devlin, Plouffe, and O. Noël have been elected Foreign Associate Members of the Clinical Society for Mental Medicine of Paris.

ONTARIO

An invitation was extended by the Academy of Medicine of Cleveland, Ohio, to the Fellows of the Academy of Medicine of Toronto, to attend a meeting of the former body, arranged for the evening of May 17th. The program for this meeting was arranged by the Program Committee of the Toronto Academy. A warm welcome was expected by the Canadians. In a letter received from Cleveland the following passage occurs: "There is an atmosphere of expectancy among our Academy members in anticipation of the Toronto visit, and I am hoping that a large delegation will be able to come. An inspection of our new Medical Library building, the new medical centre under construction, and two hospitals and the medical school already completed, with clinics in many hospitals, should make the trip worth while." It is much to be regretted that this rapprochement never took place, owing to the terrible disaster that took place at the Clinic Hospital in Cleveland on that date.

The annual report of the Program Committee of the Toronto Academy of Medicine shows that twelve regular meetings were held with an excellent attendance; thirty-eight sectional meetings and five clinical meetings were also held. The Library and Historical Evening, on January 8, 1929, was particularly worthy of mention, as the Harvey Historical Film was presented by Professor Charles Best, to whom it was released by the Royal College of Physicians of London. The following visitors honoured the Academy by addresses on various occasions: Drs. Hugh Thursfield, London, Eng.; F. Maurice McPhedran, Philadelphia; E. W. Archibald, Montreal; Mr. H. W. Carson, London, Eng.; Col. L. W. Harrison, London, Eng.; Drs. H. J. Gerstenberger,

Cleveland; Donald C. Balfour, Joseph C. Bloodgood, Baltimore; J. W. White, New York; W. B. Howell, Montreal; Joseph King, New York; Luther C. Peter, Philadelphia.

The relations that exist, or do not exist, between the private practitioner and the various health bodies and associations that are now interesting themselves in public health and welfare are not always the best that could be devised, and, accordingly, attempts are now being made in different parts of Canada to bring about more harmonious action. The annual report of the Committee on Public Health Relations of the Toronto Academy of Medicine, given here, will serve to show something of what is being done in Toronto in this direction.

"During the year 1928-1929 your Committee met eleven times. The Medical Officer of Health was interviewed in regard to the report forwarded to him by Council embodying the results of the Committee's investigations into some complaints by private practitioners re the activities of the Department Public Health. Full consideration of the report was promised and a reply assured. This came to hand in due course and as a result of the investigation, the reply and conferences, many difficulties have been smoothed out and a better understanding between the Medical Officer Health and the private physician assured.

New forms have been drawn up and approved by both the Academy of Medicine and the Department of Public Health for use in the child welfare centres. Contact has been established by the Academy of Medicine with the Home and School and Child Welfare Councils and the Academy is endeavouring to aid them in their propaganda in regard to the claims for better

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IN HAY FEVER AND ASTHMA—especially in the allergic and reflex groups, the daily administration, by mouth, of 1 to 5 grains in divided doses has afforded relief in a very large percentage of cases.

TABLETS—MOULDED

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Tablet

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No. 279—Ephedrine Hydrochloride	½ gr.
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SYRUP (NO. 35)

offers a convenient form for administering the drug by mouth. Palatable and of pleasing colour, indicated especially for the treatment of hay fever, asthma and urticaria in children.

SOLUTION

Ephedrine Hydrochloride 3% in distilled water.

INHALANT—NASAL SPRAY

Ephedrine (Alkaloid) 1% in neutral oil, coloured and pleasantly perfumed.

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CODEINE
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ATROPINE

TABLET NO. 272 "Frosst"

R Acetophen 5 gr.
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 has been found to give prompt and effective relief from the symptoms associated with this distressing affection. The excessive secretion from nose, throat and eyes is quickly controlled.

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CANADA

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care of the pre-school child. In doing this, however, care is being taken to see that the rights of the general practitioner are not infringed upon since it was soon found that these enthusiastic and useful organizations in their endeavour to do good to one section of the community were somewhat inclined to overlook the just claims of another and important section of the community, namely, the family physician. Your Committee have every hope that these difficulties will be overcome and have undertaken to provide speakers, addresses, etc., for the use of the Child Welfare Council in their propaganda amongst the members of various organizations in this city.

Again your committee would like to urge upon the private physician the necessity of his co-operation in this matter and seek in every way to educate his own patients as to the necessity of periodic examination for all members of a family.

Also we urge the keeping of records of all patients and hope soon to present for your consideration a simple history form which will be of assistance in this most necessary phase of a practitioner's work, not only from the standpoint of reference, but of research.

May we as a committee urge again your co-operation

in these matters so that while we protect the rights of the practitioner and see that there is no sudden and unnecessary invasion of these rights, we, as a profession, do not lag behind in the procession of progressive scientific medicine.

All of which is respectfully submitted.

HARRIS MCPHEDRAN,

Chairman, Committee on Public Health Relations."

It is announced that St. Michael's Hospital, Toronto, has decided to conduct a post-graduate course for one week during the month of September. Further details will be published later.

N. B. GWYN

Professor Andrew Hunter, who has been appointed to the Gardner Chair of Physiological Chemistry at Glasgow University, was recently the guest of honour at a dinner given by his colleagues in the Faculty of Medicine of Toronto University at the York Club.

Dr. F. S. Burke, formerly Director of Medical Services, Department of Public Health, Toronto, is now attached to the staff of the Department of Pensions and National Health at Ottawa.

MANITOBA

Dr. P. H. T. Thorlakson read, by invitation, a paper on "Ulcerative colitis" before the American Proctological Society at Detroit, on May 13th.

The Medical Research Committee has recently issued a comprehensive report on their activities in connection with the 1928 epidemic of poliomyelitis in Manitoba. The value of convalescent serum in treatment of the disease prior to the onset of paralysis was stressed.

The Minister of Health and Public Welfare has issued a report prepared by the Public Welfare Committee on the tuberculosis situation in Manitoba.

Grace Hospital, Winnipeg, has recently installed a Victor-Snook x-ray apparatus of the latest type.

Dr. G. B. Roatta, Councillor of the Federazione Nazionale Italiana Facista per la contre la Tuberculosis, and director of dispensaries in Florence, and Dr. Armand-DeLille, Secretary General of the Grancher Foundation, and an outstanding French paediatrist, addressed a meeting of medical men under the auspices of the Manitoba Medical Association on June 3.

Hon. Dr. E. W. Montgomery, Minister of Public Health, addressed the Junior Board of Trade of Winnipeg on May 6, taking for his subject "A better breed of men." He discussed the sterilization of mental defectives.

During the present session of the Legislative Assembly the Minister of Health has introduced bills providing for the licensing and regulation of private hospitals, and for compulsory vaccination and anti-typhoid inoculation in mining and railway camps. The latter bill was prompted by the outbreak of a number of cases of typhoid and of some cases of smallpox in camps on the line of the Hudson's Bay Railway.

On May 4 seven undergraduates were installed as charter members of the PHI RHO SIGMA medical fraternity, and subsequently another medical undergraduate was initiated. The installing officers were Dr. Ralph W. Elliott of Cleveland, Ohio, general secretary, and Dr. Gordon Kelly of Toronto. The Manitoba chapter can be termed a daughter chapter of the University of Toronto.

On May 17, at the closing meeting of the Winnipeg Medical Society for the term 1928-29, the following officers were elected for the ensuing year: *President*, R. Rennie Swan, M.B., Ch.B.; *Vice-president*, F. A. Benner, M.D.; *Secretary*, H. D. Kitchen, M.D.; *Treasurer*, John M. McEachern, M.D.; *Trustee*, F. J. Hart, M.D.

Dr. A. M. Davidson showed a motion picture film by Col. L. W. Harrison, British Ministry of Health, dealing with the "Clinical signs, pathology, diagnosis and treatment of syphilis."

ROSS MITCHELL

SASKATCHEWAN

A post-graduate team, consisting of Drs. J. W. Richardson, and W. H. McGuffin, of Calgary, toured Saskatchewan in May. They spoke at ten places to appreciative audiences. Dr. Richardson discussed "Gastric and duodenal ulcers" and "Gall-bladder disturbances"; Dr. McGuffin spoke on "X-ray and radium therapy," and on "Interesting conditions of the gastro-intestinal tract."

The Vital Statistics Division of the Saskatchewan

Department of Public Health has issued a questionnaire to the profession regarding deaths from diphtheria. There are forty-two questions to be answered regarding each death, one of which is "Was there negligence in this case, in your opinion? on whose part,—parents, physicians, Health Department?" The Minister of Public Health, Hon. Dr. J. M. Uhrich, stated at the Trustees Convention that each death from diphtheria was a case of suicide or of homicide, and should be investigated as such. The government has evidently begun in earnest to combat the lethargic ignorance

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Dry Powder Capsule No. 313 = 15 minims;

Dry Powder Capsule No. 314 = 20 minims; Dry Powder Capsule No. 315 = 30 minims

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which prevents children receiving the benefit of immunity from diphtheria.

Dr. Murray Thompson, of the Social Hygiene Council of Toronto, in his address on Public Health before the National Council of Women in Saskatoon, told of the lessening of the incidence of venereal disease in the larger cities of Canada which followed the establishment of free treatment clinics, operated jointly by the provincial and federal governments since 1917. He also discussed the proposed bill which has passed its second reading in the Senate to make a medical examination compulsory before marriage. Dr. Edna Guest, Chairman of the Committee on Public Health in the National Council of Women, in her report, stated that the time was not yet ripe for the passage of such a bill. The discussion that followed proved that the Council thought it advisable to go slowly in this matter of law making, and not to burden the people with a law that would be unpopular even if it were a good one. Much education of public opinion should be done so that health before marriage is demanded by the people.

Dr. Mabel Hanington, of St. John, N.B., convenor

of the Committee on Mental Hygiene in the National Council of Women, advised the women to consider the matter of sterilization of the mentally defective carefully and not take it as a solution of all the problems arising in regard to these cases. The members from Alberta were most enthusiastic about this measure, but the women from the other provinces adopted a more conservative viewpoint, and resolved to watch the experiment in Alberta before urging the matter upon their own provincial governments.

At the May staff meeting of the Regina Grey Nuns' Hospital Dr. J. V. Connell presented a case of nephrolithiasis in a girl of sixteen. Operation showed a number of stones in the kidney pelvis varying in size from a bean to a walnut. Seven years before the same girl had had a stone removed from the opposite kidney. Recovery was uneventful. Dr. J. S. Ritchie reported a death from brain abscess following empyema; Dr. W. A. Harvie reported a death following coronary thrombosis; Dr. B. C. Leech reported a case of early pregnancy resulting in incarceration of the uterus, which recovered after pregnancy.

LILLIAN A. CHASE

ALBERTA

During the latter part of April a tour of Alberta was made by representatives of Manitoba University, under the auspices of the Canadian Medical Association's extra-mural post-graduate grant. Medicine Hat, Lethbridge, Calgary, Drumheller, Red Deer, Stettler, Camrose, Vegreville, and Edmonton were visited. Dr. B. H. Olson, Lecturer in Clinical Medicine, was unable to be present, owing to illness.

A. M. Davidson, M.B. (Edin.), Lecturer in Medicine and in Dermatology, gave lectures on venereal and skin diseases. Two excellent films prepared by Colonel L. W. Harrison, R.A.M.C., of London, England, were shown. This splendid method of teaching this subject was generally appreciated by those who attended, and the number was large at Calgary. At Edmonton more than one hundred were present. In some of the centres visited physicians travelled forty, fifty and even eighty miles to attend the meetings, which are more than ever being appreciated by the profession throughout the province. Requests have been received for an enlargement of the program so that other points will be reached, which so far have not been visited.

Many of the former difficulties which the medical profession in the province had formerly with the Workmen's Compensation Board are being eliminated, mainly through the action on the part of physicians in coming to an agreement on the basis of fees, and a more reasonable attitude on the part of the Workmen's Compensation Board, though the physicians on their part have shown much leniency by making no demur when in each case a number of visits or treatments have been disallowed.

The Council of the College of Physicians and Surgeons sent out a plebiscite to the physicians in the province, to obtain an expression of opinion as to whether the Government Travelling Tonsil Clinics should be taken over by them, thus avoiding the necessity of the Government Clinic visiting districts already supplied with physicians. The replies have been received and were dealt with by the Council of the College of Physicians and Surgeons at the meeting held at Edmonton, May 25th.

The question of general school health inspection was also presented in a plebiscite. The reason that this

matter was brought forward was on account of the United Farmers of Alberta passing a resolution to the effect that in their opinion the Provincial Government should undertake this work. The results of the plebiscite will also be taken up by the Council.

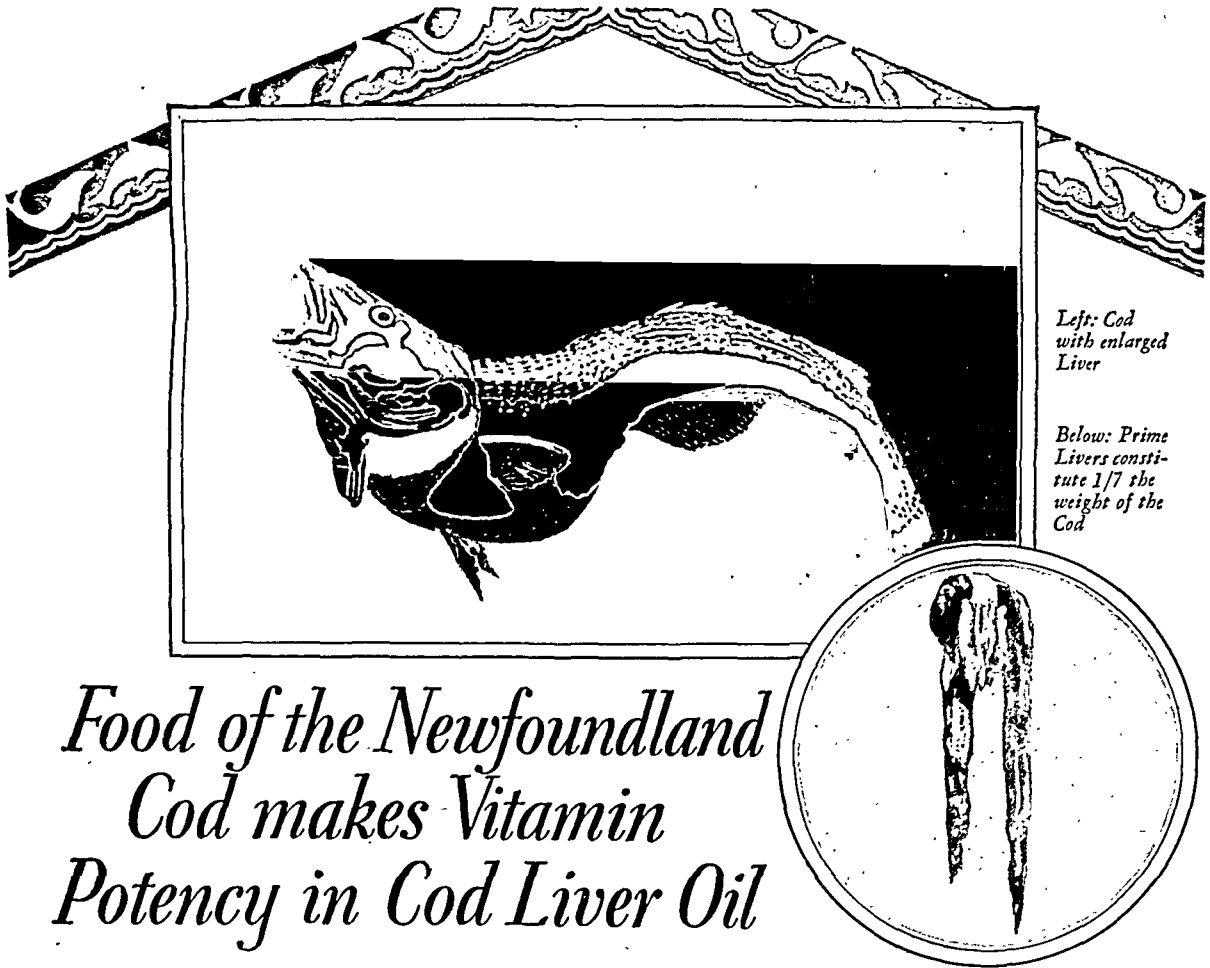
The Council of the College of Physicians and Surgeons of Alberta met recently in Edmonton and had an interesting interview with the Hon. George Hoadley, Provincial Minister of Health.

The Council stated that this representative body was prepared to suggest to the medical profession in the province, that they should undertake the work now being done by the Government Travelling Tonsil Clinic, on the basis of the present fees to the patients, namely, \$15.00 for a tonsillectomy operation and other minor surgical work in proportion. Instead of the work being done in school houses or community halls they proposed that all shall be done in hospitals under the most favourable conditions to the patients. Last year the Government Clinics cost the province \$10,000.00 in addition to all collected from the patients and almost all paid last year, which is quite different from the customary way with private accounts.

The Council made the proposal that the Provincial Government should assume all expenses for hospital care and also pay for the anesthetists' fees. This matter was taken under advisement by the Minister.

According to the laws pertaining to public health in the province it is provided that health officers will be appointed by the Municipalities. This, however, is not always acted on. Moreover, in many instances the medical officer of health is paid only by a nominal salary. The Council of the College of Physicians and Surgeons went on record that all districts organized and unorganized should have, where possible, medical officers of health and made this recommendation to the Minister of Health. It is quite apparent to the profession that if this were done and it were known who were appointed, infectious diseases would be reported earlier, and epidemics thus prevented or checked.

Another point in this connection where objection was raised was in regard to cases where serum antitoxin is given to patients who are not in hospitals. In this class of case the government holds the physician responsible for the cost of the antitoxin, when



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In Newfoundland, Cod Liver Oil production under the Mead Johnson policy is a leading industry. Codfish, dried, are by-products. Quite the reverse from other fisheries. The Newfoundland Cod after a season of gormandizing on caplin, squid, herring and sea plant life or algae, are in excellent condition for oil production.

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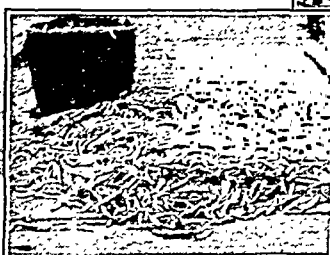
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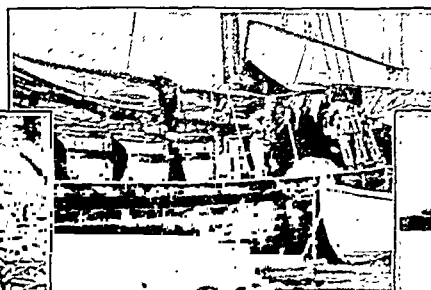
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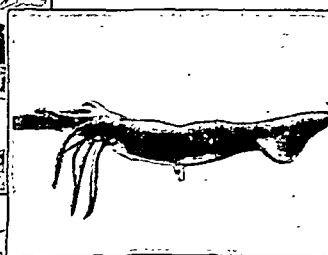
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the patients pay the cost. The Minister of Health promised to give this matter his attention.

The Council called the attention of the government to the fact that provision should be made for government run psychopathic hospitals. This was supported by a report in the late Ponoka Mental Hospital investigation. The government is of the opinion that rather than have separate institutions in two centres of the province it would be better to arrange with the municipal hospitals in Calgary or Edmonton so that there will be a psychopathic ward in each hospital, and preferably on the top floor of each. It is felt that it would be more satisfactory to the patient and to the physician in charge of the case. It is understood that as soon as possible some arrangement will be made.

At the annual meeting of the Calgary Medical Society, held on April 25th, the following officers were elected for the 1929-1930 sessions: *President*, Dr. W. S. Quint; *Vice-president*, Dr. R. G. Williams; *Secretary*, Dr. W. H. McFarlane; *Treasurer*, Dr. George A. Anderson; *Executive Committee*, Drs. A. S. Estey, J. W. Richardson, and E. Sisley.

Incorporation of the Society under the Benevolent Societies Act, was announced as having taken place during the past year.

The members of the Calgary Medical Society listened to two most interesting and instructive addresses on the evening of June 5th by Dr. Armand-DeLille of Paris, France, and Dr. G. Roatta, of Florence, Italy. These were given under the auspices of the Canadian Medical Association post-graduate grant. The subject of tuberculosis was covered in great detail in many of its respects by Dr. Armand-DeLille. Dr. Roatta dealt with the public health aspects of this disease as dealt with in Italy.

The following physicians have recently registered in the Province of Alberta: T. E. Kirke, Calgary; F. R. G. Langston, Marwayne; W. Currie, Edmonton; F. E. Brown, Taber; J. W. Giffen, Strathmore; R. H. Hicks, Craigmyle; H. W. Toby, Claresholm; G. C. Bradley, Stereo; B. J. Hallows, Queenstown.

Dr. Harold W. McGill, M.C., of Calgary, who recently underwent a serious operation at the Calgary General Hospital is now making good progress towards recovery.

Dr. Frederick Hogan, who for many years has been practising in the Yukon, intends settling in Alberta.

Dr. Gordon Douglas, formerly of Edmonton, but who is now attached to the Johns Hopkins Medical School, Baltimore, has been visiting his old friends in Alberta.

Drs. J. W. Richardson, F.R.C.S. (Edin.), and W. H. McGuffin, of Calgary, who recently made a tour of Saskatchewan under the Canadian Medical Association post-graduate scheme have returned home. They state that they had good attendance at the meetings and had a most enjoyable time. They gave lectures at nine different towns during the trip.

Dr. M. E. Busby has resigned his position at the Central Alberta Sanatorium, and has left for the Coast to take post-graduate work in radiology before returning to Alberta to practise this specialty.

Dr. W. Bigelow, who has practised in Taber during the past two years, has settled in Lethbridge. His practice has been taken over by Dr. T. E. Brown, of Depot Harbour, Ontario.

Dr. M. E. Tiffin, of Nanton, recently moved to Edson, where he will practise.

Dr. Ernest A. Hunt, son of Mr. W. G. Hunt, Assistant Secretary of the Alberta Medical Association, has recovered from his serious illness, and has joined the staff of the Brett Hospital at Banff, as assistant to Dr. J. D. Robinson.

Dr. J. H. Egbert has been spending some time in Calgary, having returned from Banff, where he took charge of Dr. J. D. Robinson's practice during his absence in California.

Dr. L. C. Morris, of Brule, has returned from Boston and New York, where he took post-graduate courses in physiotherapy. He will not return to Brule, as the mines have been closed. G. E. LEARMONTH

Mark Twain has gone down in history as the man who was able to send out the information, on one occasion, that the report of his death had been grossly exaggerated. Dr. W. H. S. Scott, of Vauxhall, Alta., however, takes the lead over the American humourist, for on two separate and distinct occasions premature word of his demise has been published in the newspapers of the country. The physician, in active practice at Vauxhall, holds that not only is he still walking the earth but that he expects another 30 years of existence.

"I am still alive and in A-1 condition," stated Dr. Scott. "I have about thirty years yet to run around the country. I am not exactly sure who wants me dead but this is the second time in eight months that my death has been published in Toronto papers. I am not worrying about it."

BRITISH COLUMBIA

The commission recently appointed by the provincial government to investigate the question of health insurance has held a number of meetings, but has not yet held any public sessions.

On May 7th Dr. H. E. Ridewood, of Victoria, addressed the Fraser Valley Medical Society at New Westminster on "Simple mechanics of the pleural cavity." The meeting was very well attended and concluded the most successful season that the Society has enjoyed.

On May 9th fifty medical men from Seattle met a similar number of the Vancouver profession in the annual golf match for the Perry cup. The local team

were successful in winning the cup, which has been held by Seattle for years, from the visitors. A most enjoyable day, with beautiful weather, terminated in a dinner, following which the guests were escorted to their steamer.

During the last week in June the annual summer school of the Vancouver Medical Association was held in the Hotel Georgia. The list of teachers comprised Dr. Thos. Addis, San Francisco; Dr. C. H. Best, Dr. W. G. Gallie and Dr. Norman B. Gwyn of Toronto; Dr. Oswald S. Lowsley, New York; and Dr. Ernest Sachs, St. Louis.

Dr. F. C. Bell has resumed his duties as Super-

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intendent of the Vancouver General Hospital, following a protracted illness.

Dr. W. H. Wood of Greenwood was a recent visitor to the coast.

Dr. L. H. Appleby paid a visit to Rochester, Minn. recently. From there he travelled by air to Chicago and Louisville, Kentucky, and home.

Dr. S. Bonnell recently paid a visit to Calgary, accompanying Mrs. Bonnell on the first stage of a trip to England.

Dr. R. B. Shaw, recently of Essondale, is at present acting as locum tenens at Bella Bella.

Dr. J. A. Minorgan has joined the staff of the Provincial Mental Hospital at Essondale.

Dr. G. S. Gordon has left for an extended visit in England and on the continent.

Dr. E. J. Sheffield, recently of Coalmont, is doing post-graduate work in the east. C. H. BASTIN

GENERAL

The Post-Graduate Course at Graz, Austria

The Dean of the Medical Faculty of the University of Graz calls attention to the advantages of his city for residence and for medical study. Graz is a fine city of 160,000 inhabitants, 170 miles south of Vienna, (4 hours by train) with many fast trains daily. It is situated in the foot-hills of the Alps, and has a delightful climate, the nights in summer being pleasantly cool.

The general hospital of 1,600 beds is one of the newest in central Europe, fully and modernly equipped, and divided into separate buildings for each major specialty. Recognizing the successful methods of Vienna in giving medical instruction to English-speaking medical men, the Faculty of Graz has drawn up a comprehensive plan of post-graduate study, embodying the following points:—

All courses will be given in English.

There will be a minimum of didactic and theoretical work, and the clinical aspect and bed-side instruction will be stressed.

The courses will be of moderate cost.

After a specified length of stay, to ensure a well-rounded out grasp of the specialties, a diploma will be granted.

All necessary information can be obtained by writing to Docent Dr. Knaus, Landeskrankenhaus, Graz, Austria.

International Medical Post-Graduate Courses in Berlin

These courses are arranged with the help of the medical faculty of the University by the Lecturers' Association for Medical Continuation Courses and the Kaiserin Friedrich-Haus. Part of the courses take place permanently; part only in October, 1929 and March, 1930.

I. Permanent Courses

1. Of monthly and semi-monthly duration dealing with all kinds of branches of medicine.

2. Courses as guest-assistants in clinics, hospitals and laboratories during two or three months and longer for gentlemen desiring to do practical work under systematic supervision.

II. Courses in October, 1929

1. Group course: "Progress in internal medicine with special regard to stomach and intestinal diseases" (from Oct. 1st-12th); fee RM. 75.

2. Course in Neurology, Psychiatry and Psychology (from Oct. 14th-19th); fee RM. 50.

3. Post-graduate course in Diseases of Children (from Oct. 14th-26th); fee RM. 100.

4. Course dealing with the chemical and physical foundation of medicine (from Oct. 21st-26th); fee RM. 50.

5. Post-graduate course for throat, nose and ear specialists (from Oct. 7th-19th; relatively 26th); fee RM. 100.

6. Single courses on all special fields of medical science, including practical work.

III. Courses in March, 1930

For March, 1930, the following courses are contemplated:

A course on the different branches of Internal Medicine.

A course on the progress in the domain of Surgery.

A course on Skin and Venereal Diseases.

An X-Ray course.

A course on Obstetrics and Gynecology.

The courses are held in German, but numerous professors are able to lecture in the English, French and Spanish languages.

The information bureau of the Kaiserin Friedrich-Haus für das ärztliche Fortbildungswesen, Berlin, N.W. 6, Luisenplatz 2-4, is instrumental in procuring suitable lodgings, gives information as to cost of stay, arranges the attendance in clinics at operations, etc., and, on request, sends detailed syllabuses.

Thirteenth International Congress of Ophthalmology

The thirteenth International Congress of Ophthalmology will be held at Amsterdam from September 5th to 13th under the presidency of Professor van der Hoeve of Leyden. In connection with this congress committees have been appointed to prepare reports on the following subjects: the examination of visual acuity; perimetry; notation of the cylinder-axis; examination of the light sense; standardization of the visual examination of railwaymen, motor drivers, seamen, and airmen; and uniformity in the program of ophthalmological studies. The fee for membership of the congress is twenty-five Dutch florins. Further information can be obtained from the Secretary of the Editorial Committee of the Congress, Wilhelminagasthuis, Amsterdam.

Sir StClair Thomson

Sir StClair Thomson's election as a corresponding member of the Academy of Medicine is the highest honour that can be bestowed in France on a medical man. The election has been most cordially approved by the profession, happy to greet a man who is as popular in France as he is in Great Britain, and who is in every sense of the word quite at home on this side of the Channel. We trust that his perfect knowledge of French may allow him, from the Academy platform, to maintain and develop the links holding together the British and French medical schools. We call our academicians *les immortels*; Sir StClair is highly qualified to add to immortality a quality that it may sometimes seem to have lost—perpetual youth.—G. Monod in Brit. M. J.

Miss Anne Hartley, R.R.C.

It was announced from Geneva on June 12th that

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For the Prevention and Treatment of

TETANUS

Tetanus is an ever-present menace to all patients who present punctured or lacerated wounds, and modern medical practice calls for the use of a prophylactic dose of 1500 units of Tetanus Antitoxin in all such cases.

The annals of the medical history of the Great War record not only the striking value of Tetanus Antitoxin as a preventive of Tetanus but also its notable value in treatment.

Tetanus Antitoxin as prepared by the Connaught Laboratories is most carefully refined and concentrated and is particularly suitable either for intramuscular or for intravenous or intraspinal therapy.

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CANADA

Miss Anne Hartley, Royal Red Cross, Matron-in-Chief of the hospitals of the Canadian Department of Pensions and National Health, has been awarded the Florence Nightingale medal. The award goes biennially to a few nurses in different countries who have rendered conspicuous service in time of war or public calamity.

Miss Hartley, a graduate of the Toronto General Hospital, served in France, England and Salonika from 1915 to 1919 and received the Royal Red Cross medal

in 1916, with bar in 1919. Last January she was appointed Matron-in-Chief for the department's hospitals.

Honour to Theodor Billroth

Austria has struck a coin, a two shilling piece, bearing the image of Theodor Billroth, 1829-1929. Probably this is the first time that a nation has issued a coin to honour a medical man purely for his professional attainments.

Book Reviews

Diseases of the Liver, Gall-Bladder and Bile-Ducts.

Sir Humphry Rolleston, Bart., K.C.B., M.D., Hon. D.Sc., F.R.C.P., and John William McNee, D.S.O., M.D., D.Sc., F.R.C.P. Third edition. XIII and 884 pages. Four coloured plates and 87 figures. Price 42/- net. Macmillan and Company Limited, London, 1929.

All will welcome the appearance of the third edition of Sir Humphry Rolleston's great work on the liver, in preparing which, this time, he has had the valuable assistance of Dr. J. W. McNee. It is seventeen years since this work appeared before, and much has been discovered and recorded about the liver during that period. The volume is very timely, for we are just now beginning to apprehend the great importance of the liver in metabolism. In fact, this organ bids fair to regain the pride of place which it lost when Galenism went, somewhat undeservedly, into the discard.

From its first appearance Sir Humphry's book has been, for English readers at least, the final court of appeal on any matter relating to the liver and its accessories, and it is gratifying to find that it has been brought up to date. The work now contains useful summaries of the anatomy and physiology of the liver and biliary tract, which will do much to assist in the understanding of the newer conceptions of hepatic and biliary disease. The important subject of jaundice has been reconsidered, and the new diagnostic procedures, the tests for disorders of the hepatic function, and cholecystography, are dealt with in a most helpful way. No phase of hepatic and biliary pathology is left untouched, but the chapters that appeal to us most are those dealing with jaundice, cirrhosis, cholecystitis, and cholelithiasis. The development of our ideas on these subjects is dealt with historically, and it is easy to see where we stand at the present time. Two special points may be referred to in the matter of calculus formation the old view of Naunyn has given way to the conception of Aschoff and Baumeister, who held that there are two types of gall-stones, the non-inflammatory or metabolic, and the inflammatory, a view that is now practically universally accepted. In regard to the difficult question as to the importance of alcoholic excess in the causation of portal cirrhosis, the authors, after a careful statement of the evidence *pro* and *con*, come to the following conclusion: "It may safely be held that alcoholism is frequently an antecedent condition, but that *per se* alcohol has no specific action on the liver except fatty degeneration. It gives rise to cirrhosis in a secondary manner, either by leading to the production of sclerogenic poisons, or by enabling such poisons to have full sway on the liver. The importance of alcoholism has been rather exaggerated, and it is not sufficiently recognized that other factors may cause cirrhosis, and that a congenital or acquired want of resistance on the part of the liver itself is, though hard to estimate, probably of great importance." This, it may be remarked, is substantially the teaching in Montreal of the late Professor J. G. Adami. It would be difficult to praise this work too much.

It is comprehensive, simply written, and is much more than a treatise on the special pathology of the liver and biliary passages. It deals with diagnosis and treatment as well. The references to the literature are abundant, and chapter and verse are given in this connection; we are pleased to see Canadian work recognized. The illustrations are good and the index excellent. The treatise should be in the hands of every clinician.

A. G. NICHOLLS

Surgical Pathology. William Boyd, M.D., M.R.C.P. Ed., F.R.S. Can., Professor of Pathology, University of Manitoba. Second Edition; 933 pp.; 15 coloured plates and 474 illustrations. Price \$11.00. London and Phila., W. B. Saunders Co., 1929. Canadian Agents; McAinsh & Co. Ltd., Toronto.

Time was, and that not so long ago, when it was not thought necessary for a surgeon to know anything about pathology. This probably accounts for the dearth of really good books dealing with the subject as it more particularly bears on surgical work. That time is now past, and every surgeon who desires to be something more than a superior type of carpenter feels that he should know something of the science of his subject. But where is he to look for this instruction? We think that he cannot do better than look in Boyd's Surgical Pathology. This excellent work which first appeared in 1925 has just reached its second edition. It has to some extent been recast and re-written and has been brought up to date. About 130 illustrations have been added. The most striking changes are in connection with tumours of the central nervous system, which have been re-arranged on the basis of Bailey and Cushing's work, and the malignant tumours of bone, which are considered in the light of new information obtained from the Registry of Bone Sarcoma of the American College of Surgeons. Among other subjects, either dealt with *de novo* or somewhat expanded, are, Cadham's studies on the treatment of septicæmia, pre-cancerous lesions, the reticulo-endothelial system, diverticulosis, Wilkie's work on the etiology of chronic cholecystitis, Counsellor and McIndoe's work on hydrohepatosis, the etiology of rickets, and the recent criticisms of Sampson Handley's views on lymphatic permeation. The chapters on the thyroid, stomach, and the breast seem to us to be particularly valuable and judicial. The bibliography, while not intended to be complete, covers the chief papers that will be found helpful under the various topics. The illustrations are good, and really illustrate, while the coloured plates are beautiful. It is pleasant to note the attention that has been given to Canadian work. Many little hints are scattered through the book which will be of practical utility to the surgeon. Altogether, we regard this as the best book that is extant at the present which deals with this most important branch of pathology.

A. G. NICHOLLS

Thyroxine. Edward C. Kendall, M.S., Ph.D., D.Sc. 265 pages, with charts. Price \$5.50. Chemical Catalog Co., New York, 1929.

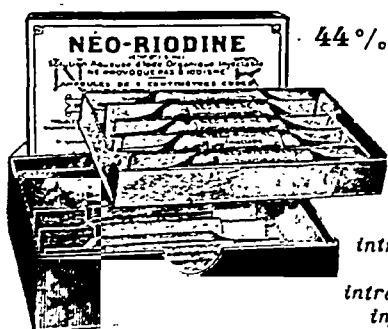
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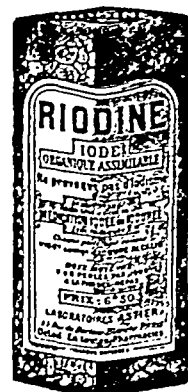
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good reasons has been held until now. It would, as is remarked in the preface, have been out of date now, even if published two years ago. Naturally the book is the result of work done from the point of view of the chemist, but it was the relief of hypothyroidism by the clinician that first attracted chemical investigation, and from then on the chemist has worked with the main idea in view of correlating thyroid activity and oxidation, and this book contains the sum of all the knowledge gained from past work to the discovery of thyroxine by the author.

The first chapter gives a full history of previous work and the most important workers, full credit being given to each. Nurnberg, especially, being shown to have been close to discovery.

Chapter two deals with the first isolation and identification of thyroxine by Kendall, and reviews the various methods used in isolating the compound and the efforts to find its true chemical formula, with the time consuming and expensive work connected with it. Chapter three contains the result of work which cannot but be of absorbing interest to every reader, carrying over from chapter two Harrington's work and Kendall's re-investigation resulting in the finding of varying iodine contents of thyroid glands according to season and geographical situation. Chapters four, five and six continue the chemical history, so to speak, six dealing with the chemical nature of that large percentage of iodine in the thyroid gland which is not in the form of thyroxine. It is in this chapter that the only jarring note in what must be called an outstanding book occurs, when Kendall uses the word "misleading" in relation to Harrington's paper on the isolation of thyroxine. It may not mean what it seems to mean, but Kendall's work is too big for any small oversight in the use of words in criticizing another's paper to be allowed to mar it, and I trust this will not be overlooked in the next edition.

From chapter seven onward the book becomes of more interest to the internist. All clinicians and others interested in the thyroid must make themselves fully familiar with this work. The foundation for future chemical and clinical work, already built on partly, still has room for other chemical structures of great interest and clinical value, as is shown chapter by chapter. And that the workers are not few is shown by the very fine bibliography.

C. S. McKEE

Morphologic Variation and the Rate of Growth of Bacteria. Vol. 1, Arthur T. Henrici, M.D. 194 pages with charts. Price \$3.50. Charles C. Thomas, Springfield, Ill., 1929.

This is the first volume in a series of monographs on microbiology and is a good introduction indeed. Of course a book such as this necessarily will appeal to a limited number of readers, mainly men or women doing purely laboratory bacteriology. It deals with bacteria from the standpoint of the "Pleomorphist" rather than the "Monomorphist" and is, as the author states, a record of personal researches into the subject, presented with the hope of stimulating others to take up similar studies.

The problem which is to be faced is clearly explained in the first chapter, although some of the terms used will be new to all but the initiated. The second and succeeding chapters give the work done and data collected with mathematical expression of the results.

The summing up in the last chapter, followed by an appendix and bibliography, completes a very interesting volume on a line of approach to the solution of a problem which will be of value in a much wider field than bacteriology.

C. S. McKEE

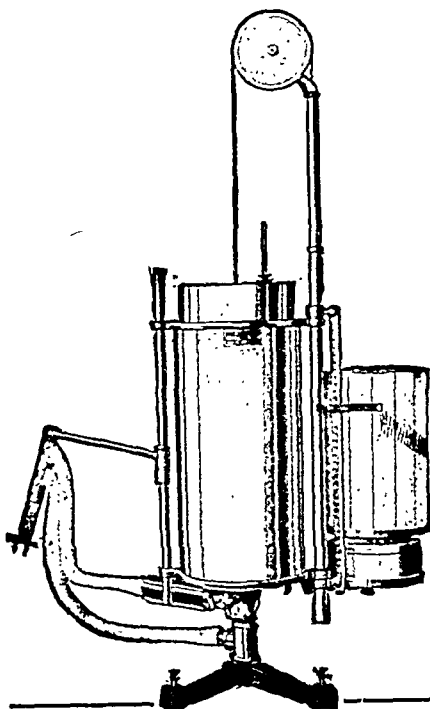
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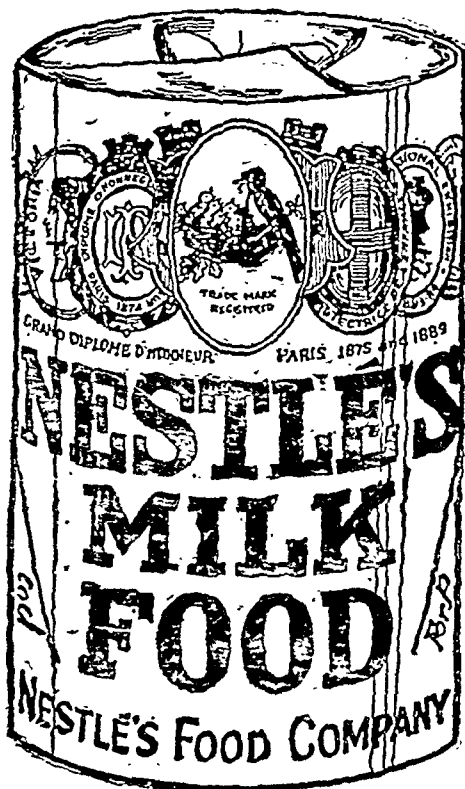
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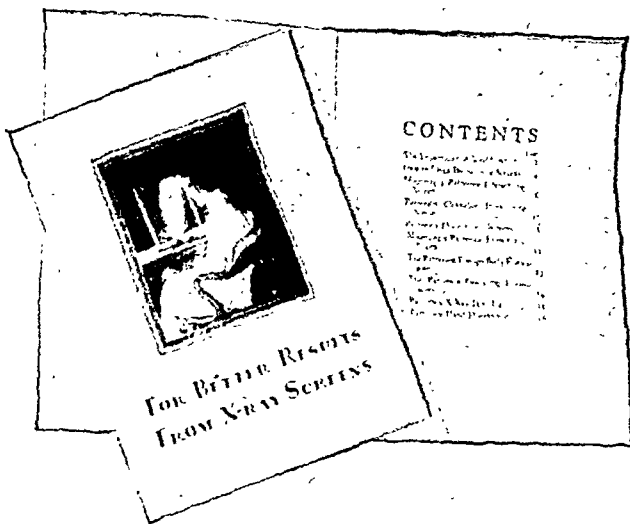
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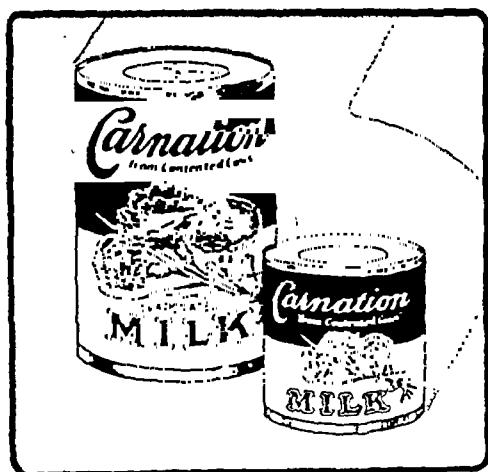
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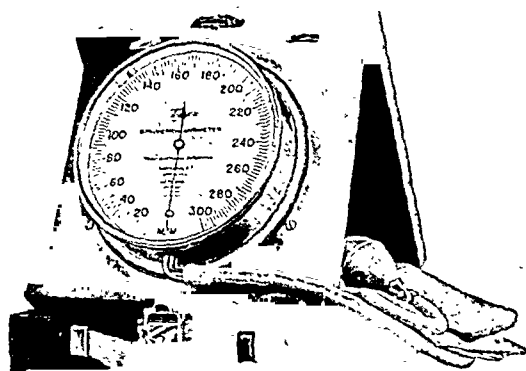
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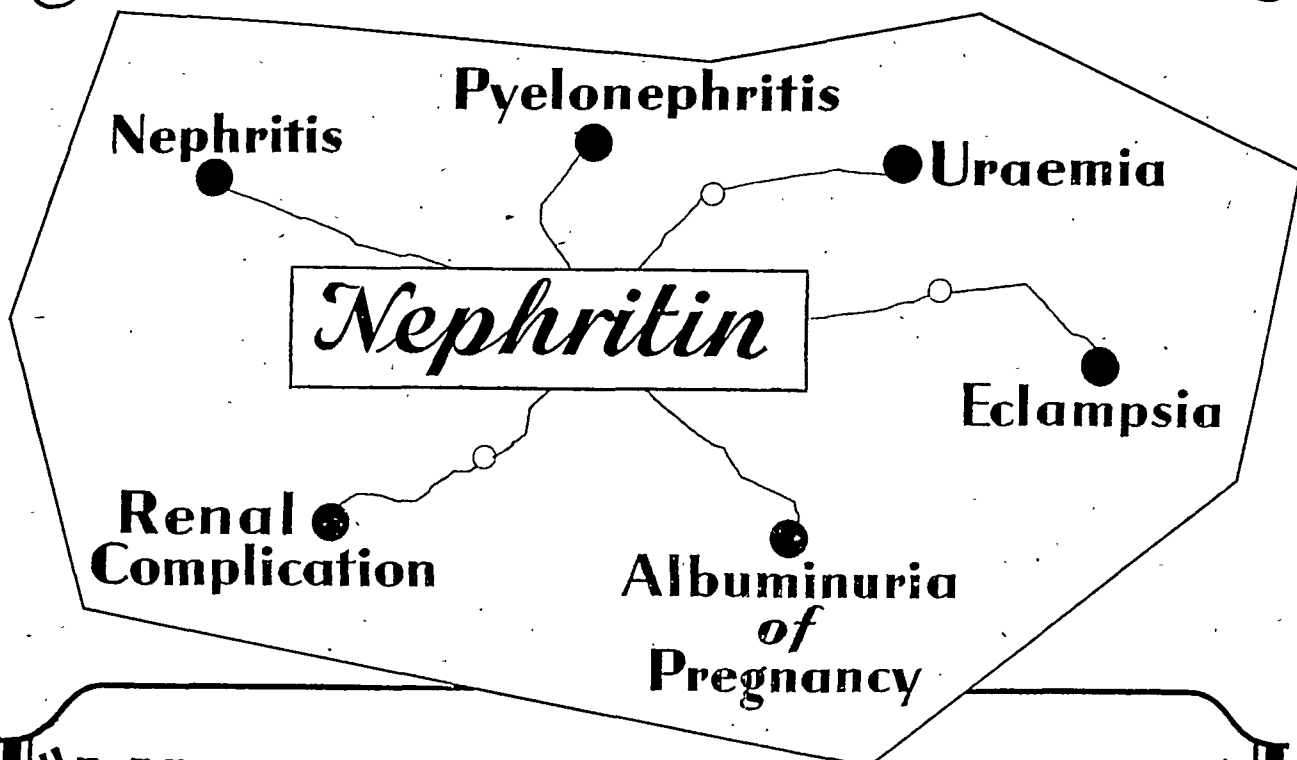
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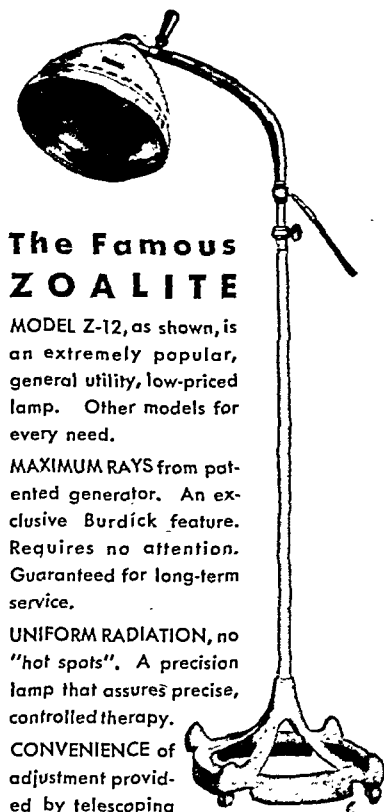
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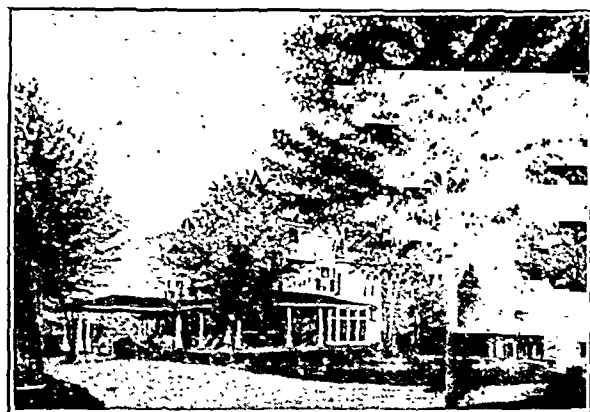
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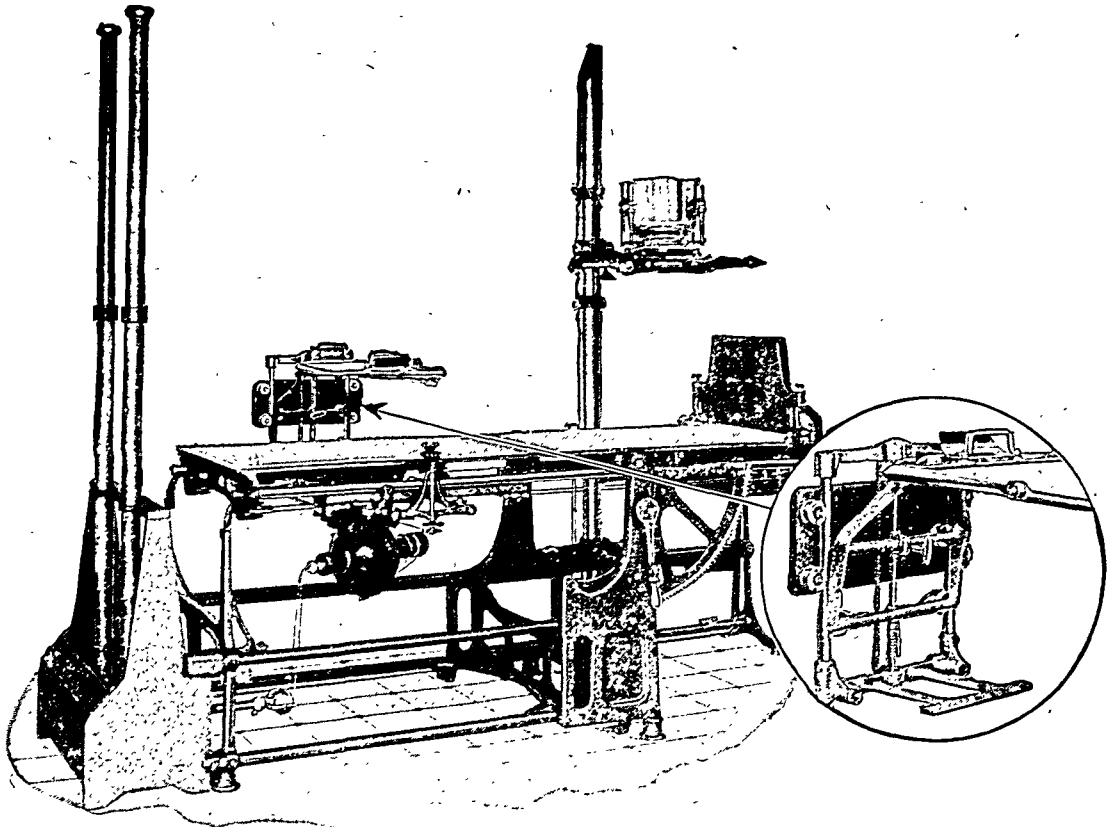
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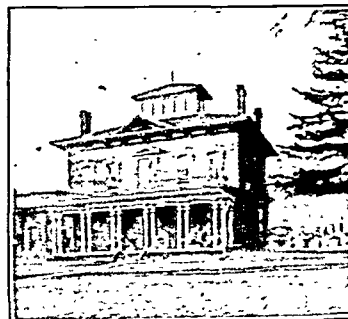
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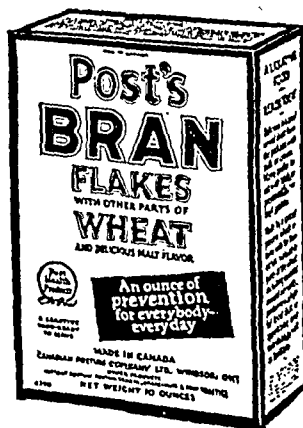
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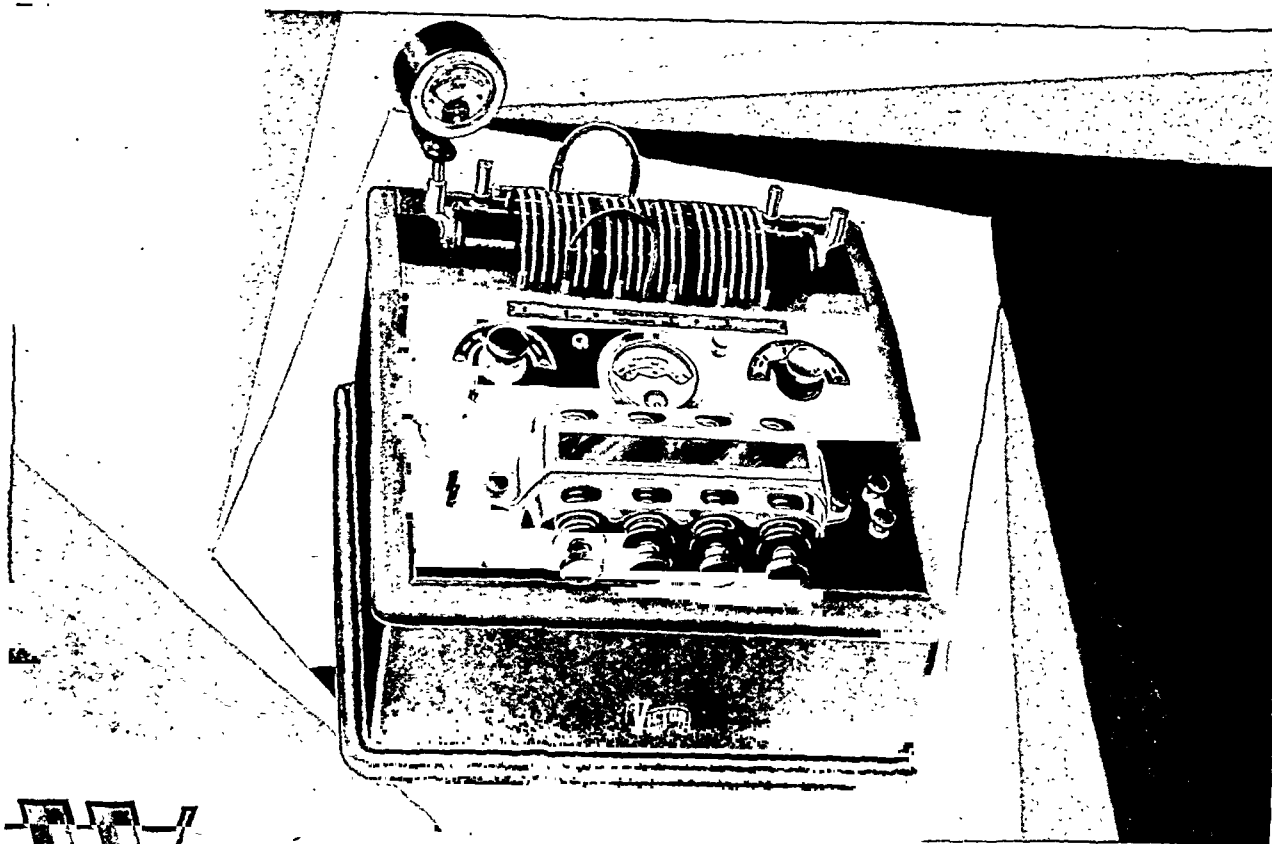
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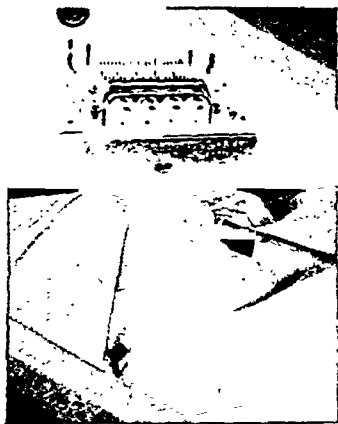


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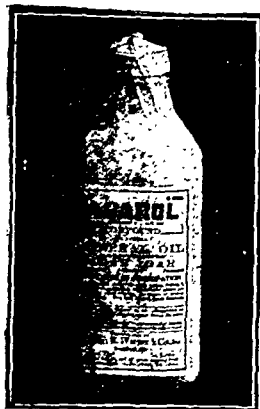
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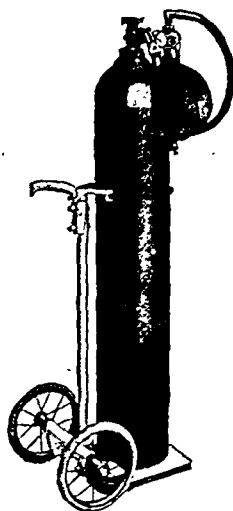
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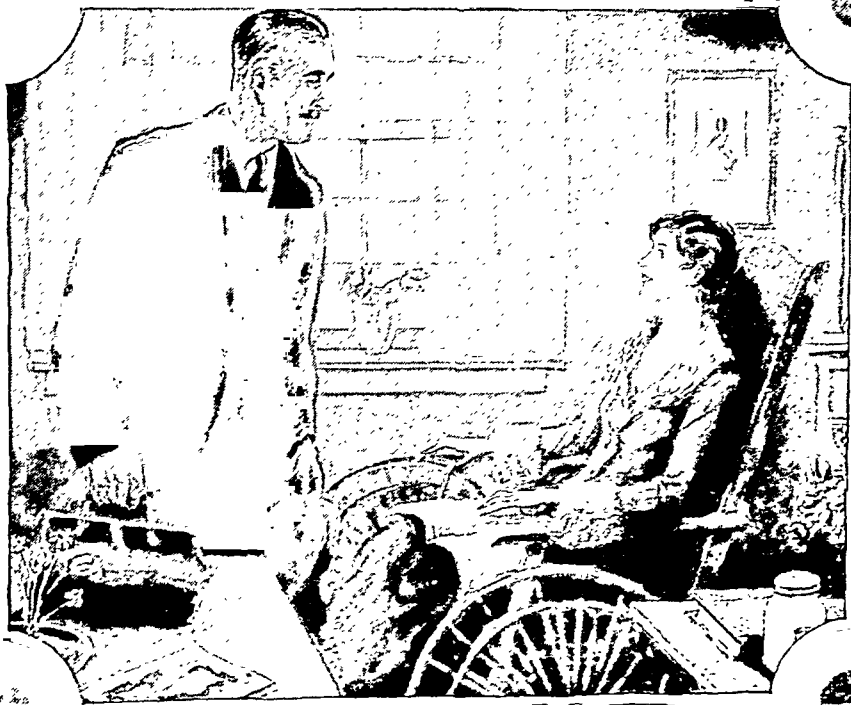
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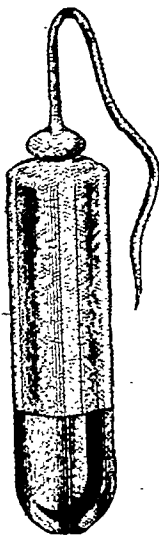
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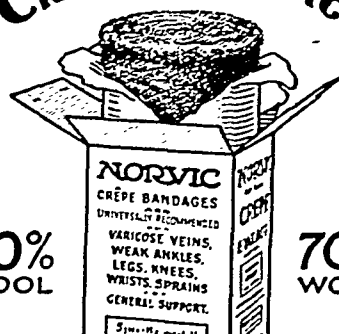
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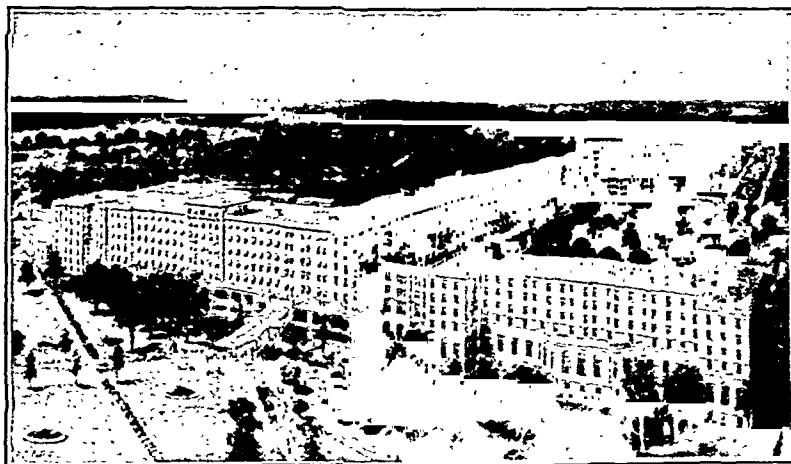
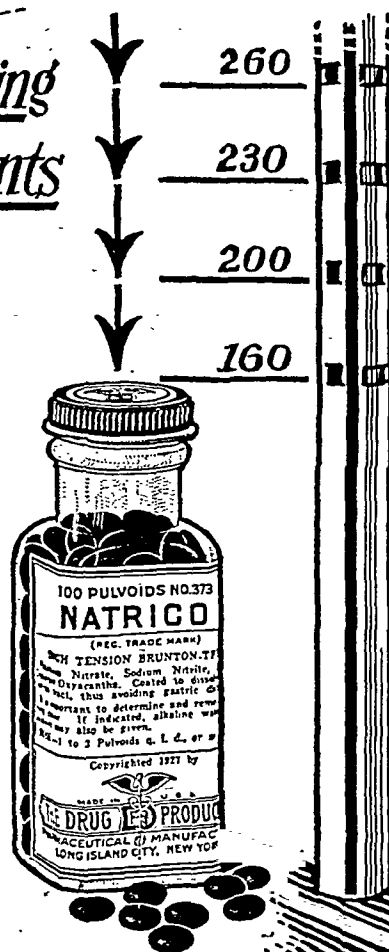
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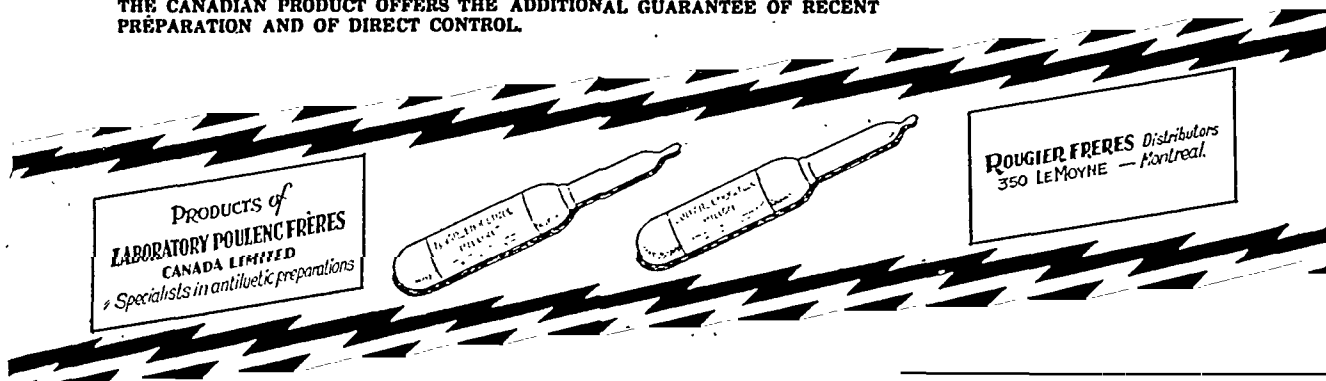
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No. 5

An Address

ON

LYMPH-STASIS THE PRECURSOR OF CANCER*

By W. SAMPSON HANDLEY, M.S., F.R.C.S.,

*Surgeon to the Middlesex Hospital and to the Middlesex Cancer Hospital,
London*

I PROPOSE to use my opportunity to-day for the purpose of laying before you my views on the origin and causation of cancer. Carry your minds back, then, to the dawn of the world, uncounted millions of years ago, when life first appeared upon its surface in the form of amœba-like organisms, each a single cell, a single unit of living protoplasm, animated by two fierce passions—the desire for food and the desire to double its ego by the simple process of cell-division.

A little later in time there arose from these unicellular organisms, organisms composed of many cells living together in a communal life like that of a small village or a great city. The cells are now specialized into groups, and each kind of cell follows a trade or profession, exerting for the community its special skill, receiving from the community in exchange food, warmth, and protection. To carry out the scheme and to ensure that each cell receives its due share of food, and of such cell products as it no longer makes for itself, elaborate systems of conduits—the circulatory, lymphatic, and glandular systems—have been evolved, and equally elaborate machinery, comparable with the telegraphs, telephones, and newspaper and business offices of the city, brings information of the outer world, and controls the activities of the cell community.

As Sir Arthur Keith¹ has said: “The resemblance between the body physiological and the body politic is more than an analogy; it is a reality,” and Mr. Morley Roberts² has insisted that politics must be regarded as a branch of the science of biology.

It is a part of the bargain that the individual cells shall abandon the primitive right to unlimited cell division. In the many-celled animals this right is reserved to the cells of the ovary and testis.

THE ORIGIN OF MANY-CELLED ORGANISMS

It is an interesting speculation how the many-celled organisms arose from the unicellular individuals, which were presumably the first living things to appear on the globe. It appears likely that they arose from some inhibition of the process of cell division when it had proceeded half way, that is to say, the nucleus completely divided, but the cell protoplasm still remained connected by protoplasmic strands. There is evidence that the cells of the higher animals are still interconnected by protoplasmic bridges. To understand the origin of multicellular organisms the most hopeful avenue is a study of the processes which inhibit or frustrate cell division after the process has been initiated. Such a study might be pursued upon the amoeba.

Note that, if the foregoing sketch of evolution is true, each cell of one of the higher animals is descended from a primitive one-

* Delivered at Wellington before the New Zealand Branch of the British Medical Association, February 19, 1929.

celled organism with an irresistible appetite for food and for multiplication. Note, further, that these are the appetites which dominate the cancer cell, and you may be led to conclude that cancer is an atavistic reversion of certain cells of the body to the state of their primitive one-celled ancestors. Such a conclusion would, in my opinion, be correct. The cancer cell is a selfish unicellular organism, derived by direct descent from the cells of the body, but living among them as a parasite.

You might further be led to compare the cancer cell, with its fierce antisocial individualism, to an anarchist in the body politic, and to inquire whether the anarchist represents a spontaneous reversion to the savage primitive type of man, or whether he is the product of disorders in the social organism. Experience shows that the anarchist does not appear, or is soon exterminated, in prosperous and happy communities. It is therefore probable that in cancer the reversion to the primitive cell type is conditioned by disordered bodily function. In other words, the body has failed to carry out the contract under which the cell abandoned its right to unlimited multiplication. Under that contract each cell of the body has the right to its share of the products of all the other cells. It has also a right to protection from external irritation. It is my object now to show how the contract has been violated. My observations lead me to believe that the origin of cancer is intimately associated with local obstruction of the lymph vessels in the area where the cancer arises. To produce cancer the obstruction must be of long standing—must have lasted from twenty to thirty years. It may not be complete enough to cause obvious lymphatic œdema, but may manifest itself only by papillary hypertrophy and increased cellularity of the subepithelial connective tissues. Complete direct proof of this theory is at present impossible. But if the disconnected heap of jig-saw fragments which constitute our knowledge of cancer are tried together upon this hypothesis and are found to fit as a coherent picture, a definite orientation, hitherto lacking, will be given to experimental work on the origin of cancer. It is for the reader to judge if my work fulfils the object thus stated.

It is, I think, significant to note that the

recent work of Warburg shows that the cancer cell is a cell which has somehow acquired an entirely new type of cell metabolism, but no suggestion has hitherto been offered as to the way in which this change of cell habit is brought about. It is evident that chronic lymphatic obstruction must profoundly influence the conditions under which the cell lives. The intercellular pressure must be raised, wandering cells brought by the blood will be trapped in the district and will be unable to leave it, the supply of oxygen will be restricted, and the fluid bathing the cells will be relatively stagnant—wanting, therefore, in the supply of fresh hormones derived from other cells of the body, which it should normally contain, and wanting specially in the inhibitory hormone which is the sedative to the cell's primal passion for division.

We must now consider what light can be obtained upon the etiology of the disease from a study of experimentally produced cancer. The salient facts will be found well marshalled by P. Menetrier,³ who has himself done so much to advance this subject. He shows that attempts to induce cancer by the injection of micro-organisms, or by the inoculation of embryonic grafts, have failed. Doubt is thus thrown upon the infective theory of cancer, and upon Cohnheim's hypothesis of its origin in embryonic "rests." On the other hand, chronic irritation in various forms has succeeded in artificially inducing cancer; and Menetrier's belief that cancer is a morbid process resulting from "multiple and non-specific forms of irritation," is thus justified. The successful irritant may be:

1. A physical agent, such as x-rays, radium, or heat.
2. A chemical agent, such as tar or paraffin.
3. A parasitic agent, such as the spiroptera which causes stomach cancer in rats, and possibly the bilharzia (bladder cancer) and the demodex (Borrel).

It must be observed in passing that it does not take us far to say that chronic irritants produce cancer. We want to know whether their effect is a direct one on the epithelium, or is exerted indirectly through an action upon the connective tissue. If the latter, what is the nature of the connective tissue change?

To resume our study of Menetrier. By exposing the ears of guinea-pigs for long periods to repeated small doses of x-rays he produced

hyperplasia of the epithelium and metaplastic alterations of the cells. He draws attention to the great thickening of the epithelium, and to the formation in it of cell nests, also to "papillomatous appearances," which he evidently considers deceptive and due to the down-growth of epithelial processes, a mistake which Clunet also made. He does not refer to the changes in the connective tissue of the papillæ.

In concentrating his attention upon the epidemic changes and ignoring those in the connective tissue, I believe that Menetrier has missed the true interpretation of his results. In his figure (Fig. 9) there are to be seen hypertrophied papillæ, a stage of real, if incipient,

papillomatosis. In the centre of each of the two hypertrophied papillæ on the left are seen cellular cords, uniting below to form a single vessel. My experience with lupus (cf. Fig. 7) warrants me in asserting that these cords are papillary lymphatics of origin in a state of proliferative lymphangitis. In the papillæ to the right of the figure the process has gone further: the vessels have been destroyed and a richly cellular mass of granulation tissue has replaced them (cf. Fig. 8). In my view, then, the x-rays have set up an obliterative lymphangitis of which the epithelial hypertrophy is a secondary consequence. A direct stimulating action of the x-rays upon the epithelium may no doubt occur, but it is of less



FIG. 1.—Cross-sections of skin papillæ in Paget's disease of the nipple, showing blocked central lymphatics.



FIG. 3.—An innocent duct papilloma of the breast. (Contrast Fig. 4).



FIG. 2.—Cross-sections of skin papillæ in lupus, showing blocked central lymphatics. (Cf. Fig. 1).



FIG. 4.—A duct papilloma of the breast which is already carcinomatous. (Contrast Fig. 3).

moment than the lymphangitis which Menetrier ignores, as will be seen when the facts of lupus carcinoma are studied.

Marie, Clunet, and Lapointe exposed a number of white rats to a few successive massive doses of x-rays, each dose causing a severe dermatitis. In two cases a spindle-celled sarcoma arose in the irradiated area, but epithelioma was not produced in any of the animals. These experiments, from my point of view, show the predominance of the connective-tissue changes produced by chronic radiation over the epithelial changes. Though in man the epithelial changes may ultimately prove of more serious import, they are

conditioned by previous long-standing chronic lymphangitis, and perhaps to a less extent by obliterative hæmangeitis.

It may be remarked that papillomatous hyperplasia is a recognized precursory stage of x-ray cancer. Furthermore, early x-ray epitheliomata have a tendency to remain localized for a long time, and only disseminate when they have advanced by infiltration into regions where the lymphatics are still intact. In these respects they resemble lupus cancer, which is certainly conditioned by lymphatic obstruction.

In 1923 Block succeeded for the first time in producing an x-ray carcinoma in a rabbit.

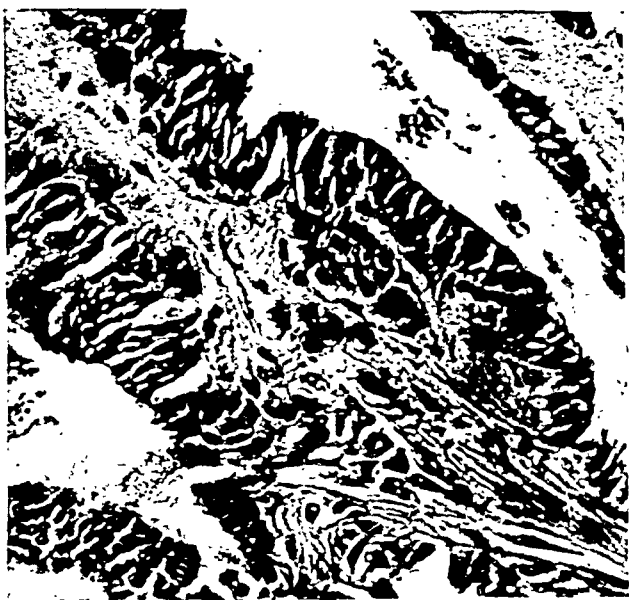


FIG. 5.—A highly magnified portion of the papilloma seen in Fig. 4, showing infiltration of its connective tissue by malignant epithelium.

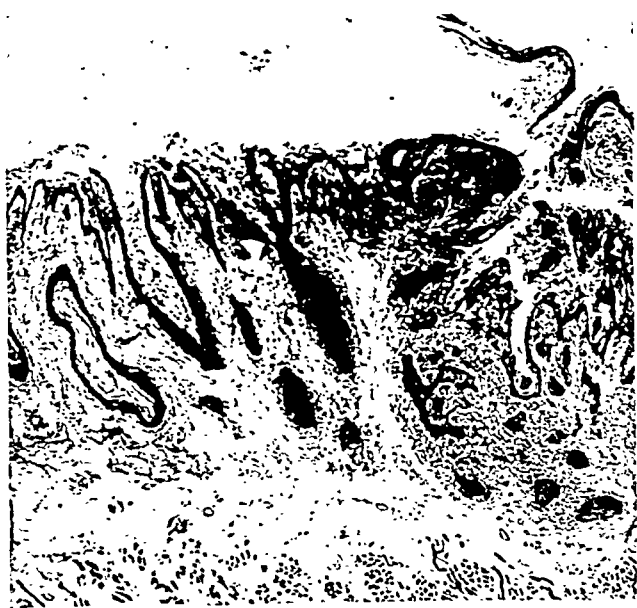


FIG. 6.—Hypertrophied papillæ adjacent to a carcinoma of the tongue. On the right the edge of the carcinoma is seen.



FIG. 7.—Section just beyond the edge of an area of non-ulcerative lupus of the skin, showing the blocked papillary lymphatics which simulate a stag's antler in outline.



FIG. 8.—A much hypertrophied papilla of the skin in lupus occupied by tuberculous granulation tissue and by a line of giant cells representing the original central lymphatic.

TAR CANCER

The precancerous stage of clinical tar cancer manifests itself by the production of warts (Fig. 11), which mostly after a time drop off, leaving an erythematous or pigmented patch. Sooner or later one of the warts grows, becomes broad-based, ulcerates, and develops all the signs of malignancy (Fig. 12). Yamagiwa and Itchikawa, in 1914, first succeeded in producing experimental tar cancer by painting the ears of rabbits with coal-tar once every two or three days. Sometimes the applications were preceded by the intradermic injection of scarlet-red, an admirable means of irritating the lymphatic vessels. In

from 30 to 100 days papillomatous new formations appeared. In certain cases after 55 to 360 days carcinoma appeared. In a later series of experiments carcinoma was produced in 77 per cent of the experimental animals. In 72 per cent metastases occurred. The same authors injected tar into the mammary gland of female rats, and produced cancer of the mamma in 12 per cent of the animals. Yamagiwa and Itchikawa state that "repeated simple chemical and physical irritation renders the normal epithelial cell cancerous, without any necessity to invoke another unknown causal agent." This statement requires examination. It is at least possible that the tar

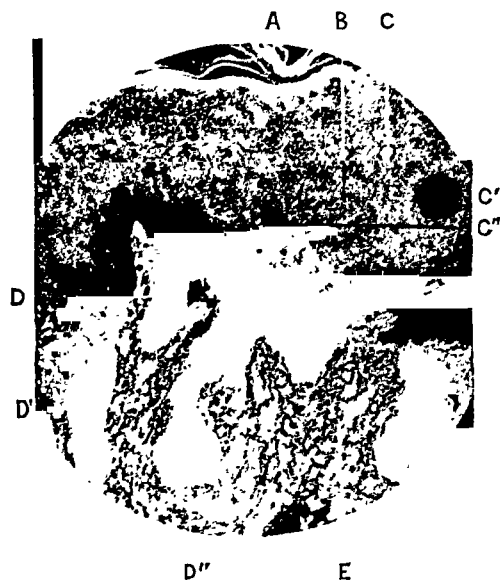


FIG. 9.—Epithelial hyperplasia and metaplasia in the ear of a rat following x-radiation. From Menetrier, *Le Cancer, Généralités*, p. 129.



FIG. 11.—Tar warts of the forearm. From a patient who had worked in hot tar for twenty years.



FIG. 10.—Lupus carcinoma of the left cheek. On the right cheek is seen an innocent papilloma.



FIG. 12.—The scrotum of the same patient, showing a tar carcinoma.

acts primarily upon the connective tissues, and we must now inquire into the evidence available upon this point. It is certain, at any rate, that the connective tissue is not indifferent to the irritation of tar, for in Fibiger and Bang's experience in tar-painting mice, out of 24 tar carcinomas 2 were accompanied by a tar sarcoma. Russell produced sarcomas by deep or subcutaneous injections of tar.

More direct evidence of the importance of the connective-tissue changes produced by tar



FIG. 13.—Portion of colon removed by operation from a case of multiple adenomata. Note the little round tumours scattered over the mucous membrane. (M.A. 5. ($\times \frac{3}{4}$.) (Dukes.)



FIG. 13A.—To show the naked-eye appearance of the simple tumours associated with a cancer of the rectum. (Dukes.)

painting comes from Borrel. He noted the accumulation of connective-tissue cells (mastocytes) forming little intra-epidermic or sub-epidermic collections. Prolongations from these mastocytes insinuate themselves between the cells of the Malpighian layer, which is thus dissociated. The observations of Borrel harmonize with those of Victor Bonney,⁴ who in every case found that the origin of cancer is preceded by increased cellularity of the subjacent connective-tissue. Menetrier, without, I think, sufficient reason, ascribes these collections of connective-tissue cells rather to accidental infections of the skin than to the action of the tar. Nevertheless, Menetrier himself, in the epithelial hypertrophy

of the hair follicles, which is one of the precursory stages of tar carcinoma, observed a great increase in the number of branched pigmented connective-tissue cells (chromatophores) lying among the deeper layers of the epithelium and in the superficial layer of the dermis. Evidently in such cases a powerful stimulus has been applied to the connective-tissue.

In the other precancerous stage of tar carcinoma, that of papillomatous hypertrophy, the deeper layer of the epithelium shows a hyperplasia of the chromatophores (pigment-bearing connective-tissue cells) which it normally contains. Later an increase of chromatophores is seen also in the underlying dermis.

It must, however, be admitted, as Menetrier insists, that in the rabbit's ear the onset of tar carcinoma may occur in the absence of any connective-tissue proliferation. It is true, as Menetrier says, that this fact runs contrary to the views of Ribbert as to the importance of inflammation of the connective-tissues in the origin of cancer, but, on the whole, the balance of evidence points strongly to the view that the action of tar is primarily upon the connective-tissue. I suggest that tar produces cancer by causing lymphatic obstruction with papillary hypertrophy as an intermediate stage in the process.

It has long been known that the evolution of a papilloma into a carcinoma is not a rare event, but the closeness of the relationship between these two forms of tumour has only very recently been realized. It seems probable that carcinoma is invariably preceded either by a definite papilloma or by a local area of papillary hypertrophy.

Chronic glossitis with papillary hypertrophy is the usual precursor of carcinoma of the tongue (Fig. 6). Cancer of the lip and of the larynx frequently arises on a pre-existing papilloma. In regard to carcinoma of the stomach there is no evidence.

Cuthbert Dukes⁵ has shown that in the neighbourhood of early carcinoma of the large bowel groups of papillomata can be usually demonstrated, though these disappear at a later stage (Fig. 13A). He infers that carcinoma of the bowel begins as a papilloma. Cases of multiple papillomata of the colon are known to end almost invariably in carcinoma, and generally before middle age is reached (Fig. 14). Dukes has

been able to demonstrate the origin of carcinoma at the tip of a papilloma (Fig. 15). On two occasions I have seen a papilloma appear at the lip of a colostomy opening as a little stalked, perfectly innocent, tumour, and develop within a few weeks into a carcinoma. On the first occasion, in a case of abdomino-perineal excision of the rectum for carcinoma, the new primary carcinoma grew rapidly and produced a malignant stricture of the colostomy opening. On the second occasion I excised the incipient carcinoma with scissors. It was the earliest and smallest carcinoma I have seen, and resembled Fig. 14.

MULTIPLE PAPILLOMA OF THE LARGE BOWEL

Jüngling⁶ has supplied a remarkable family tree covering four generations descended from a male who died of pulmonary tubercle and a female who died of old age. Both the ancestors were free of polyposis. Of their thirty-one descendants, fourteen suffered from polyposis



FIG. 14.—A complete section through a very early cancer of the rectum, which measured only 1 cm. in its broadest diameter and projected like a little button about 3 mm. above the surface of the bowel. Four small non-pedunculated adenomata were found within a radius of two inches of the growth. (M.A. 6.) (x 8.) (Dukes.)

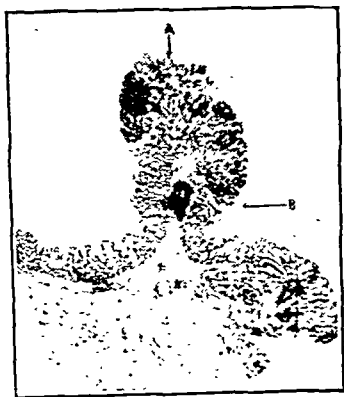


FIG. 15.—A polypoid adenoma situated close to a large ulcerating cancer of the rectum, but separated from it by an inch of normal mucous membrane. Other smaller adenomata were also present. The cells at the tip of this tumour had undergone cancerous degeneration (A) (see Fig. 15A); B, lymphoid follicle in stalk of tumour (dark mass). (M.A. 9.) (x 6.) (Dukes.)

of the alimentary tract, five from cancer of the rectum. Two of the first generation died of intestinal tubercle. Four of the six children of the first generation died of carcinoma of the rectum. For further details the family tree must be consulted. It appears to justify Jüngling's assertion that the tendency to polyposis behaves as a Mendelian dominant.

Professor Jüngling makes no comment on the fact that this family had a tuberculous ancestor and that tubercle reappeared in the two succeeding generations. Yet it seems to me likely that this fact is the key to the unknown pathogenesis of intestinal polyposis. It is known that, when tubercle attacks the skin it may cause either an ulcerative or a warty non-ulcerative form of lupus. I believe that when it attacks the mucosa of the intestine, and fails to produce ulceration, an intestinal polyposis is the result. And just as carcinoma may attack the scarred area of a lupus, so may it arise in an intestinal polyposis. Papilloma of the

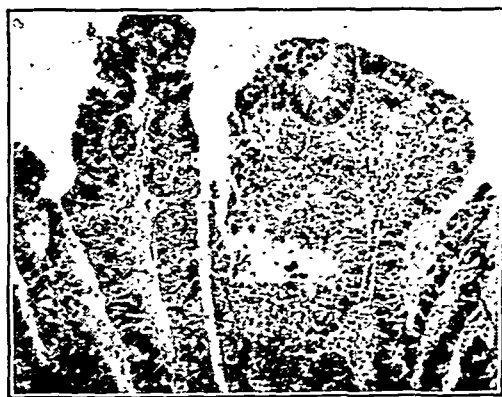


FIG. 15A.—A higher magnification of the tip of the polypoid adenoma illustrated in Fig. 15, to show onset of cancer at tip. (x 135.)

bladder likewise, in my opinion, is a non-ulcerative form of tubercle of the bladder. A case in which I removed a typical polypus from near the right ureter, and had subsequently to remove the right kidney for what proved to be advanced tubercle, remains in my mind as a probable indicator of the pathogenesis of vesical polypus.

It might appear useless to bring forward these hypotheses upon such inadequate evidence. I do so in order to suggest that some young investigator who reads these lines should endeavour to produce intestinal and vesical polypus in animals by injecting the lymphatics

locally with a suspension of active tubercle bacilli.

CANCER OF THE BREAST

In the case of the breast the appearance which Lenthal Cheatle calls the "laciform edge" is a diffuse papillomatosis of the smaller ducts. He points to this appearance as a precursor of malignancy. If, as Cheatle maintains, and I think correctly, nearly every case of breast carcinoma originates in the ducts, it is probable that nearly every case of breast cancer is preceded by papillary hypertrophy or by definite papillomata.

Duct papilloma of the breast is recognized clinically when it arises in the larger ducts and causes serous or blood-stained discharge from the nipple. Such cases, if neglected, are known to end usually in carcinoma. In the following case I was able to demonstrate the occurrence of carcinomatous degeneration in a duct papilloma of the breast, which had apparently only existed for a very short time. At the time of the operation the papilloma was suffering from carcinoma, but the disease had not yet attacked the tissues of the patient herself.

Mrs. —, aged 70, noticed a serous discharge from the left nipple a week before she was first seen on June 12, 1928. The breast was normal on palpation except that vertically, half an inch below the left nipple, a tiny very superficial shot-like swelling could be felt. Pressure at this point made fluid exude from the nipple. No other nipple changes were found. There were no glands in the axilla. On June 15, 1928, this lump was cut down upon, two dilated ducts were exposed, divided close to the nipple surface, and then again divided where they began to ramify in the breast substance. On section of the excised portion across the ducts a small papilloma, just visible to the naked eye and perhaps one-fiftieth of an inch in diameter, was found within the duct, attached to it by a slender pedicle. A section across the tissue showed that this minute and early morphological papilloma had already become a carcinoma within its own substance. The fibrous tissue of its core was infiltrated with carcinoma cells, though there was no evidence that the physiological tissues of the patient had been attacked by the disease. The pedicle of the papilloma, fortunately included in the section, was composed of fibrous tissue only, and showed no infiltration. (Figs. 4 and 5).

An indication of the pathogenesis of the papilloma was, however, given upon examination of the pedicle. It showed several cylindrical groups of round-celled infiltration, some cut as circles, others as ovals. In company with one of the groups was a small artery. These are exactly the appearances given by blocked lymphatics which have lost their lumen by proliferation of their endothelium, as I know

from my experience of lupus and elephantiasis. In other words, the patient had suffered from a chronic lymphangitis of the tissues of the breast, and it appears highly probable that the resulting lymph-stasis was one of the main exciting causes of the papilloma which so rapidly developed into a potential carcinoma. It appears possible that the *Demodex folliculorum*, known by the work of Dr. Helen Chambers and others to be so common an inhabitant of the nipple and of the terminations of its ducts, is competent to excite mild infections and abrasions of the nipple, which, while causing no clinical symptoms, may nevertheless set up a chronic lymphangitis.

By this time you will, I think, admit that a process of papillary hypertrophy, sometimes only to be shown microscopically but often producing visible warts or papillomata, is the characteristic precursory stage of carcinoma. Chronic irritation, whether it be bacterial or chemical, would appear to be a cause of cancer, because it is a cause of papillary hypertrophy. If this be so, a study of the origin of a papilloma may be the key, and at least must be an essential preliminary to an understanding of the genesis of carcinoma.

THE PATHOGENESIS OF THE PAPILLOMA

If a single papilla of the skin or of a mucous membrane is examined it is found to consist of a tent-like elevation of the connective tissue, carrying in its substance a mesh-work of blood capillaries. These capillaries are supplied by an arteriole and drained by a venule. The papilla is clothed by a covering of epithelium, and it has always been presumed by the dermatologists that the active agent in the formation of a papilloma is increased proliferative activity on the part of the epithelium, and that the increase in size of the connective-tissue papilla is merely a response to increased nutritive demands from the active epithelium. Unna, on these grounds, objected to the word "papilloma," and wanted to substitute for it the word "acanthoma," as indicating an innocent tumour of the prickle epithelium. He ignored an essential anatomical element of the papilla which is the key to its normal and morbid physiology. The central structure of every papilla of the skin or the mucous membrane is a lymphatic capillary exactly like the lacteal

vessel of a papilla of the small intestine. I have demonstrated this by direct lymphatic injections of the skin, as well as by a study of diseases affecting the skin lymphatics (Figs. 1 and 2). Papillary hypertrophy occurs, and I believe only occurs, when this central lymphatic vessel of the papilla is blocked. The papilla is a little physiological engine. From its blood capillaries there exudes into its connective-tissue spaces a constant nutritive stream of diluted blood plasma at a certain pressure. The excess of fluid is renewed and the equilibrium maintained by the drainage action of the central lymphatic. Block this lymphatic and what will happen? The first effect will be a rise in the pressure in the intercellular spaces of the papilla, and on ordinary hydraulic principles the papilla will increase in size until the intercellular pressure is equal to the pressure in the capillary blood vessels. A second effect will be over-nutrition and consequent proliferation of the papilla itself and of the overlying epithelium. But the most important effect of all for our present purpose remains to be considered. In the normal papilla a constant stream of blood fluid, along with lymphocytes, is exuding from the capillaries and passing away by the lymphatic. As soon as the lymphatic is blocked, stasis occurs and the flow of fresh blood fluid through the papilla is arrested or greatly retarded, even though just as much blood may be passing through its blood capillaries. Two consequences are inevitable: the supply of oxygen to the tissues of the papilla, to its epithelium as well as to its connective tissue, will be much reduced; furthermore, the supply of hormones to the cells of the papilla will be cut off or greatly diminished. In this connection I use the term "hormone," perhaps somewhat loosely, to signify those products of the rest of the cells of the body which are necessary to the well-being of the cells of the papilla we are considering. Here, I think, we approach the crux of the problem. Local lymphatic stasis brings about a definite rupture of the contract in virtue of which the unicellular organism originally forswore its egotism and became a social unit. Or, in the terms of biochemistry, the epithelium covering the papilla is deprived of the supply of growth-inhibiting substance, which in a well-conducted cell community is circulated to every cell.

I have shown that local lymphatic obstruction must seriously reduce the supply of oxygen to the epithelium of the blocked papilla. It would not be surprising if, in the course of years, the affected epithelium, adapting itself to meet this difficulty, should acquire a type of metabolism in which oxygenation played a relatively subordinate part. Warburg has recently brought forward strong evidence that the carcinoma cell, as compared with the normal epithelial cell, is an anaerobe, deriving most of its energy from the hydrolysis of sugar into lactic acid, and relatively little from oxidation. This remarkable fact is in exact accord with the theory of the origin of cancer which I am presenting to you. It must not be forgotten that in dealing with such a complex matter as the origin of cancer, direct proof is, in the earlier stages, not to be expected. All that can be hoped is to fit together the isolated facts into a coherent pattern.

In only one variety of cancer can I present with absolute clearness to you all the stages from the initial obstruction to fully developed carcinoma, a cycle of changes occupying in the human subject from twenty to thirty years. Tuberculous lupus, especially of the non-ulcerative variety known as lupus erythematosus, is followed, in a certain proportion of cases, by the appearance of warts upon the scarred surface, and one or more of these warts may develop into carcinoma (Fig. 10). Lupus carcinoma has been stated to be an x-ray carcinoma, and it may have become more frequent since the discovery of x-rays, but it was quite common before x-rays were known, and it is a natural evolution of the disease process known as lupus. By the examination of sections at and just outside the growing edge of areas of non-ulcerative lupus, I have been able to show that the disease is essentially an obliterative tuberculous lymphangitis which destroys the lymphatics (Figs. 7 and 8). The characteristic lupus nodules found in the derma are produced by proliferation of the endothelium of the affected lymphatics. The earliest stage of the lymphangitis is seen in apparently normal skin outside the visible edge of the diseased area (Fig. 7), and here also papillary hypertrophy of the diseased papillae can be seen. Passing back to the centre of the area of lupus, progressive enlargement of the papillae up to five times their normal

length can be seen. Here, then, it is evident that blocking of the lymphatic is the primary factor, with chronic papillary hypertrophy as its consequence. The further development of the papillary areas into carcinoma is a matter of common clinical knowledge. If tubercle affecting the skin may cause papillary hypertrophy, may produce definite papillomata, and may ultimately give rise to cancer, it would seem likely that tubercle in other parts of the body may have the same result. It is perhaps significant that the form of lupus which most commonly produces cancer is the non-ulcerative or papillary form in which there is lymphatic obstruction without ulceration or destruction of tissue. This fact lends colour to my suggestion that multiple papillomatosis of the large intestine, and also papillomata of the bladder, are really products of abortive local tuberculous infection occurring in early life.

In this connection I would draw your attention to some very interesting observations by Dr. Thomas Cherry⁷ of Melbourne. He ascertained statistically that whereas during the last thirty years the death rate from tuberculosis has greatly diminished and that from cancer has greatly increased, the combined death rate from tubercle and cancer together has remained at a constant level. This curious fact, though susceptible of several interpretations, in his opinion indicates that persons who recover from an attack of tubercle are likely in later life, and as a consequence of their attack of tubercle, to die of cancer. Since every tuberculous infection is of the nature of a chronic lymphangitis, and must leave behind it some degree of lymphatic obstruction, Dr. Cherry's facts, derived from the whole mortality experience of England over a long series of years, offer rather a startling suggestion of the importance of tubercle, and hence of lymphatic obstruction, in the etiology of cancer. Early this year Dr. Cherry published in the *Medical Journal of Australia* a paper in which he records that, by the subcuticular injection of active tubercle bacilli in mice, he has been able to raise the incidence of malignant tumours in the mice experimented on to a significant extent. These experiments call for repetition and confirmation. It is certain that under modern conditions an abortive attack of tubercle is a common event of early life. The frequency of healed scars at the pulmonary apices and of

tuberculous tonsils and adenoids suffices to prove this. May not mild, undetected tuberculous infection of the mammary glands in childhood leave behind them areas of lymph-stasis which give rise in middle life to duct papillomata and carcinoma of the breast?

Where I would differ from Dr. Cherry is in denying to the tubercle bacillus any specific rôle in the production of cancer. In my opinion any pathological process which gives rise to lymphatic obstruction may be a cause of cancer. The specific factor is not the particular organism concerned, but the lymphatic obstruction to which that organism may give rise.

The tubercle bacillus is not the only organism which finds itself at home in the sluggish stream and quiet backwaters of the lymphatic vessels. The history of syphilis is mainly a study in the pathology of chronic lymphangitis. The primary lesion is a local proliferative lymphangitis. There follows enlargement of the regional lymph glands, and then an invasion of the great fascial lymphatic plexus with an accompanying secondary rash, often presenting papillary lesions. The mucous membrane where it joins the skin is next invaded, and here lymphatic obstruction is clearly evidenced by the appearance of condylomata, mucous patches, and moist papillomata of the tongue and lips. Then, in the tertiary stage, the deeper lymphatics are invaded, and gummata, which are areas of local proliferative lymphangitis, make their appearance (Fig. 16). The chronic glossitis which syphilis leaves behind it is an obstructive lymphangitis, known frequently to lead to papillary hypertrophy and carcinoma. Carcinoma of the lip and of the inside of the cheek frequently arises on the scar of an old mucous tubercle.

Chronic lymphangitis is not exclusively caused by the organisms of tubercle and syphilis. It may be due to many other organisms—for instance, to the members of the *pyogenic group*—and these organisms, also, in so far as they may produce lymphatic obstruction, are potential cancer-producing agents. Chronic lymphangitis may also be set up by a chemical or thermal agency. I have already given *prima facie* reasons for thinking that tar cancer, and the kangri cancer of Kashmir, and the epithelioma which occurs on the scars of old burns, are caused in this way. The fact that spontaneous tar cancer in man is usually preceded for years

by the appearance of crops of warts which drop off, leaving a pigmented area, is presumptive evidence of the co-existence of a chronic lymphangitis, and the initial lesion of the tar carcinoma of mice is usually a papilloma.

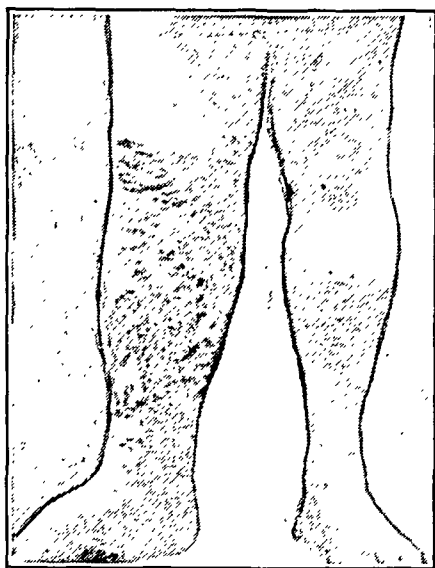


FIG. 16.—Gummatous elephantiasis of the right leg. From a case seen with the late Dr. J. J. Pringle.

Papillary hypertrophy as a consequence of pure lymphatic obstruction, apart from local infection, is perhaps best seen in elephantiasis. I have also produced it experimentally in the ear of the rabbit by placing an elastic ligature, not so tightly as to strangulate the blood vessels, round the base of the ear. Warts not rarely occur upon prolapsed rectal mucosa, and may become malignant (Fig. 17).



FIG. 17.—Prolapse of rectum with polypi.

Is there any connection between elephantiasis and carcinoma? If my contentions are correct, there ought to be. Well, I would point out that the chronic ulcers of the legs so often seen in elephantiasis may become malignant. A more striking example of the connection is within my experience. A lady who had lived in India for many years came home with typical elephantiasis of one leg. She was persuaded by a friend's advice to try radiant heat baths for the leg, and

shortly afterwards virulent multiple epitheliomata, twenty or thirty in number, appeared on the skin of the affected leg. The regional glands became enlarged and she died in a few months. In this case, judging by the multiplicity and activity of the growths, the cancerogenous factors were very active. The diseased leg differed from the healthy one in two obvious respects; it was the seat of long-standing lymphatic obstruction, and its surface when in this condition had been subjected to irritation by heat and light.

In this address I have dealt with a great subject, my remarks contain a large element of speculation, though for the sake of brevity and emphasis I have put them in dogmatic form. I shall be content if you admit my proofs that lymph-stasis lies at the root of cancer—certainly of carcinoma, probably of sarcoma. For the rest, my address is a working hypothesis, which may perhaps serve to orientate the work of younger men.

The anatomist, the physiologist, and the biochemist, and I would add the physician, have devoted too little attention to the lymphatic system. The biologist has never attempted to produce from a unicellular organism a bicellular one, still less a multicellular one. There exists, I believe, a four-celled organism, two of whose cells only possess mouths. Here in embryo is the multicellular animal. I challenge the biologists to produce experimentally a two- or four-celled organism from a unicellular one. When this has been accomplished, the converse problem, that of the origin of cancer, may prove easy of solution.

In conclusion, I do not want a tombstone, but neither am I content to lie under the green turf of oblivion. I would like to be remembered for two things; first, as having shown twenty-five years ago that cancer spreads mainly by lymphatic permeation; and, secondly, as having demonstrated to-day the importance of lymph-stasis in its etiology.

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An Address

ON

THE CLASSIFICATION OF OPERATIVE RISKS IN RESPECT OF THE OPERATION OF THORACOPLASTY FOR PULMONARY TUBERCULOSIS, AND THE RESULTS OF THAT OPERATION*

BY EDWARD ARCHIBALD, B.A., M.D., F.R.C.S., ENG., (HON.),

*Professor of Surgery, McGill University,**Montreal*

THE subject that I have to speak on to-night is chiefly concerned with the classification of those patients suffering from pulmonary tuberculosis who are candidates for thoracoplasty, in respect of the risk involved and the results that may be expected.

I need not here discuss theoretical considerations, for the subject in its broad outlines is now fairly well understood. My purpose is rather to submit to you the results of a personal experience, based upon the analysis of 168 cases, in order to convince the unbeliever, if there still be such, that surgical treatment in certain forms of pulmonary tuberculosis may well be accepted on its merits. One must be careful to say "certain forms," because there is a danger that the very simplicity of the operative technique may lead the unthinking surgeon into the path of disaster. No other thing is so important as to realize that the essential difficulty lies in the judicious selection of the case, that is, in the operative indications.

As regards technique I will say no more than that the usual operation, as you know, is what is called extrapleural thoracoplasty, and that this consists in the resection, outside the pleura and subperiosteally, of eleven ribs, a resection which is done at the vertebral ends over a distance varying from one to six or seven inches, and in two or even three stages. In regard to the anæsthetic to be employed, my own choice has throughout been the combination of gas and oxygen, with novocaine for the skin and the intercostal nerves.

The minor operations of apicolysis, phrenicoc-

tomy, and pneumolysis will not here be discussed.

Surgical intervention is to be considered in three main types of lesion. Of these the most frequent is represented by the ordinary, uncomplicated, parenchymatous tuberculosis of one lung, showing a strong tendency to fibrosis. The second indication is found in certain complications of artificial pneumothorax, and the third in tuberculosis complicated by empyæma. Before proceeding to discuss these three classes, may I be allowed a few words of a general nature?

In the first place, while it has been a general rule that the disease must be strictly unilateral, such ideal conditions are only rarely to be found. Nearly all cases show some disease on the good side. It should be remembered that practically all the patients who ultimately are referred to the surgeon are far advanced, according to the classification of the National Tuberculosis Association: they are patients in whom medical treatment, including pneumothorax, has reached the limit of its efficacy. In such, when one revises the history carefully, and when there is available for study a series of photographs, it is very frequently found that the disease at onset was bilateral, but that on one side that disease has been largely cleared away, or at any rate brought to long quiescence, while the other side has proceeded to fibrosis and cavity formation. So that, for the purpose of establishing the indications for thoracoplasty, it is not so much a question of knowing if one lung is diseased and the other comparatively free, but rather, being face to face with one markedly diseased lung and the other lung much less diseased, of estimating the resistance

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which those lesser lesions of the better side are able to oppose to the stress of operation. The problem is much more biological than anatomical, and our chief concern should be to establish an exact accounting of the patient's general resistance.

As a rule, resistance is shown by the degree of fibrosis, for fibrosis itself is Nature's method of healing. Therefore, we look for the evidence of this fibrosis through a study of the patient's previous history, through a careful physical examination, and, above all, through the help of roentgenograms, if possible a series of such. In the roentgenogram the signs of fibrosis are seen in that property which belongs to all scar formation, the property of contraction. We look, therefore, for a displacement towards the side of the lesion of the trachea, the mediastinum and the heart; of the ribs, which take on a more vertical position; and of the diaphragm, which is pulled up. In this study the help of the qualified internist and especially of the tuberculosis expert, particularly if there has been opportunity for prolonged observation, is invaluable. Are suspected lesions of the good side progressive? Are they showing signs of activity? In what direction is the clinical course tending? What will happen in the course of the next year or two if no operation is done? These and similar questions are best answered by the medical man, and the answer is extremely important. It is obvious, however, that there are degrees of safety and of danger, and I have recently decided to adopt the classification of Brunner, Sauerbruch's pupil, according to which the patients are put in three categories; the favourable, the doubtful, and the unfavourable. And you will see that the prognosis of operation varies so much as to justify such a classification. I must, therefore, first define these three classes.

FAVOURABLE CASES

Here we have to deal, pathologically, with chronic fibroid tuberculosis, predominantly unilateral, usually with cavitation, although the cavities should not be larger than a pigeon's egg, and without any sign of activity in the good lung. From the clinical point of view the disease has practically always been present for two years or more. The patient is an adult, in good general condition. His temperature and

pulse have long been normal or nearly so, but his sputum is positive. Artificial pneumothorax has been tried and found impossible, or has been judged inadvisable. Sanatorium care is recognized as having come to the limit of its usefulness. On the other hand, the patient can not resume active life, because regular work would probably provoke a relapse; nor should he resume community life because his sputum is positive. Moreover, his outlook is ultimately not good. The follow-up statistics of sanatoria demonstrate that even these "good chronics," with cavitation, tend strongly to gradual deterioration within the lapse of a few years, and that a considerable proportion die from the progress of their disease. It should not be forgotten that even these good cases are classed by the National Tuberculosis Association as "far advanced," and the patients frequently know this, and themselves ask if nothing more can be done. Fortunately, operation is extremely promising and can be recommended. The roentgenogram shows disseminated lesions in one lung, or lesions confined to the upper third, and, what is especially important, shows a contracted lung with pulling up of the diaphragm and pulling across of the trachea, mediastinum and heart towards the affected side, all this representing Nature's more or less successful efforts at healing through scar formation. The other lung is rarely clear, but eventual lesions in it are minimal and fibrotic.

THE DOUBTFUL CASES

Here the picture is somewhat clouded by unwelcome particulars. There is more extensive infiltration of the worse lung; the cavities are multiple or large, and show a tendency to progression. Frequently, the good lung is under suspicion, the lesions in it are not certainly thoroughly arrested, or may have been active six months or a year before. Clinically, the general condition of these patients is not of the best. They are subject to periods of slight rise of temperature and pulse; they have lost a little weight and strength; they do not feel quite well and have lost appetite. The spuim is markedly positive. If a series of x-ray films for the previous year or two is available, one is apt to find a slow but steady enlargement of cavities, and occasionally a small flare-up, with fresh seeding, which has been imperfectly

after operation, of a tuberculous bronchopneumonia on the good side; and the third died three years after operation, of cause unknown, after having had the advantage of a period of moderate improvement. In this class, therefore, it is seen that the percentage of deaths ascribable to operation comes only to 3.3 per cent (1 out of 30), while the *cured* and *greatly improved* cases amount to approximately 83 per cent, and the majority of these are practically cured.

Doubtful Cases.—The patients of this class, operated on over a year ago, number 45, and 5 during the past year. Of the 45, 17 are practically cured (that is 38 per cent), 8 were greatly improved; none moderately improved; 2 were made worse, and 9 died. Of the deaths, 3 were due to the operation (6.6 per cent)—two days, six days, and seven weeks after the operation. In 6 cases death was not due to the operation, 5 dying of progressing tuberculosis, at intervals varying from one to five years after operation, while the sixth patient, having been classed as practically cured during the seven years following operation, finally died of some unknown cause, probably not tuberculosis.

Unfavourable Cases.—There were 21 patients belonging to this class and operated on over a year ago. Not one achieved a practical cure. Only 3 were greatly improved, 4 moderately improved, and 14 died. Of these 14 deaths, 8 must be ascribed to the operation (38 per cent). The other 6 died from the progress of their disease, after varying intervals.

It may reasonably be asked why operation is attempted at all in this last class, considering the poverty of results. The reason is simply that it is often difficult to estimate exactly the resistance of a given individual, and that although one may be inclined to put such a patient into this unfavourable class before operation, there remains frequently considerable doubt. One is then inclined to give the patient the benefit of the doubt, for even if the results of operation may be far from satisfactory, the outlook for such a patient under continued medical treatment is certainly desperate. It is always to be understood, however, that in the presence of definite active lesions in the good lung, in a patient whose resistance is clearly poor, it should be the rule not to operate. I am conscious of the fact that in the past I have at times allowed myself to be persuaded against my

better judgment into doing a thoracoplasty in patients of this type. And though a few of these have received more than enough benefit from the operation to justify its performance, the majority have only had to deplore the results of an ill-advised procedure. This is certainly one of the most difficult parts of the whole subject—the judging of the dubious risk. In these unfavourable cases, according to these results, we have to face a mortality of 38 per cent of operative deaths, and 28 per cent of non-operative deaths. There is left only the prospect of 33 per cent of improvements, without one practical cure.

While for humanitarian reasons it will continue to be difficult to refuse operation to these “poor risk” patients, recent experience encourages the hope that the high operation mortality can be materially reduced by doing the operation in three or four stages, rather than in the usual two stages.

PULMONARY TUBERCULOSIS COMPLICATED BY PNEUMOTHORAX

When the physician has established an artificial pneumothorax, he may feel it necessary to call in a surgeon under two sets of circumstances: the pneumothorax may be a partial one, leaving usually the adherent apex containing a cavity, uncompressed; or the pneumothorax may be almost total, but is restrained in its good effect by band adhesions running from lung to parietal pleura.

A partial pneumothorax is usually an unsatisfactory one, for the area of lung left uncompressed is the apex, in which are situated the most advanced lesions. The pneumothorax may have brought about at first a real improvement, but in many cases it ultimately becomes evident, through signs of progression, or, short of that, by an unsatisfactory stationary condition, that nothing more is to be hoped from a continuance of the pneumothorax. Under such circumstances it is indicated, in my opinion, to substitute a thoracoplasty, in order to bring about the necessary compression of the apex. Here one may either do an upper thoracoplasty on the first seven or eight ribs, if the lower lobe was previously sound, leaving a partial pneumothorax over the lower lobe; or, if the lower lobe was involved, one may abandon the pneumothorax and do a total thoracoplasty.

The suitable time for intervention depends upon the lesions which existed before the establishment of the pneumothorax. If these were acute and exudative, I think it wise to continue the pneumothorax for at least six to twelve months. If, on the contrary, the disease was from the first chronic, productive and ulcerative, I consider it useless to wait for any long time, for the reason that the lung, which is already sclerosed and contracted, will only with difficulty, at any ultimate date at which it is decided to abandon pneumothorax, be able to carry out its necessary expansion and fill again the thoracic cavity.

I have operated on 9 cases of this type. Four partial thoracoplasties yielded 2 practical cures and 2 deaths not due to operation, but to progress of the disease. Five total thoracoplasties gave 2 practical cures, 2 great improvements, and 1 moderate improvement. So that altogether we have 44 per cent of practical cures, no deaths from operation, and 22 per cent of ultimate deaths not due to operation. I cannot but feel, although the series is small, that these results constitute a fair argument in favour of giving up an insufficient pneumothorax and substituting a thoracoplasty.

With regard to the second group of total pneumothorax restrained by band adhesions, I do not propose in this place to say much. But I would like to make one point. In many of these cases the roentgenogram shows a cavity immediately underlying the insertion of the adhesion, which has the particular effect of holding that cavity open. Not only can such a cavity not heal, but also there exists a definite danger of its rupturing during cough. Often the cavity sends a prolongation into the base of the adhesion for a distance of one to five centimetres. It is of course easy, if the adhesion is favourably situated, to cut it, either with a cautery or after open thoracotomy; but it must be remembered that the risk of empyæma following this operation runs as high as 15 to 20 per cent. I have, therefore, come to the conclusion that it is often preferable to give up the pneumothorax and to do a total thoracoplasty, for the purpose of preventing all danger of empyæma, through obliteration of the pleural space. In this idea I have, during the past year and a half, done a total thoracoplasty in two patients, in whom band adhesions

overlay a large cavity and held it stretched. Both of these recovered well from the operation. One has gone on to a "practical cure," while the other did not do so well, as there occurred a bronchogenic spread, some months after operation, into the good lung.

In five other cases the chest was opened for the purpose of cutting band adhesions. Empyæma occurred in two. Of these one patient recovered perfectly, and for the last three years has been doing a full day's work under the condition of a total pneumothorax. The other, operated on two years ago, is still troubled with a discharging sinus from chronic empyæma, and there has occurred a fresh invasion in the good lung. This patient is slowly losing ground. One other patient of the five mentioned enjoyed perfect health, with a total pneumothorax after the adhesion was cut, for some four years, after which the lung was allowed to expand and the patient remains well. In two other cases, adhesions were found to be so extensive that it was impossible to do anything, and they were allowed to go on with their partial pneumothorax. One of these patients has since died.

TUBERCULOUS EMPYÆMA

For years past I have, for practical purposes, and from the surgical point of view, been accustomed to arrange the empyæmata occurring in the course of pulmonary tuberculosis, including those which complicate a pneumothorax, into three main groups.

In the first group the pleural effusion is seropurulent; in the second it is a thick, greenish fluid; and in the third it is a thick pus also, but of the nature of that resulting from a mixed infection.

Seropurulent Effusion.—Here the effusion is straw-coloured, but turbid, and usually contains tubercle bacilli, which, however, are often detectable only by the inoculation of a guinea-pig. It has occurred as the result of a simple tuberculous pleurisy, or following a spontaneous or artificial pneumothorax. In favourable cases it can disappear permanently after aspiration and a refill of air. The patient's general condition is often quite good. When after a number of aspirations in the course of six or more months the effusion obstinately recurs, and bacilli are demonstrable, I believe

that a thoracoplasty is indicated. The reason is that sooner or later such effusions tend to pass into the second class; that is, to change into the condition of a thick, greenish pus which is difficult to aspirate and which, besides containing tubercle bacilli, may show also a beginning invasion with pyogenic cocci. This is accompanied by a gradual change for the worse in the patient's general condition. A thoracoplasty, which obliterates the pleural space abolishes also the effusion, and prevents this change for the worse. It prevents also the occasional rapid transition into the third class, that of a serious mixed infection empyæma, due to a rupture of mural cavities. You are all acquainted with the extreme gravity of the mixed infection empyæmata, in which bacilli and cocci of all sorts are found in great numbers, and death is apt to occur within a few months from continued sepsis.

Of this first class I have operated on 6 cases, doing a total thoracoplasty. Of these, 2, after a period of two and one-half years and five years from the operation, are practically cured. A third was practically cured for seven years, when she died of an intercurrent illness; 2 are greatly improved three months and a year and a half after operation; and, finally, 1 is moderately improved twenty-one months after a partial operation, a wound infection having prevented the completion of the thoracoplasty.

Purulent Effusion.—Here the effusion is frankly purulent but the patient's general condition is often surprisingly good. It is sometimes difficult to discover tubercle bacilli in smears, but guinea-pig inoculation is nearly always positive. In a small proportion one can also find in smears a few pyogenic cocci. The patient is often afebrile until a large amount of pus collects in the chest, and then an aspiration and irrigation will ordinarily succeed in abolishing the fever for some weeks or even months, until a large fresh collection brings it on again. I have seen patients who had carried nearly half a chest full of such pus for as long as two years without serious effect upon their constitutional condition. But in the majority aspirations are necessary, fever becomes continuous, the pus thickens, and sooner or later the condition changes into the very grave mixed infection of the third class.

I have not hesitated, indeed I consider it

urgent, to operate upon patients of this second class in the hope of obliterating by a thoracoplasty, with simultaneous aspirations, the pleural space, and thus preventing the change into the dreaded mixed infection type. Some sort of operation, indeed, imposes itself in many cases because of gradual thickening of the pus and consequent difficulty, amounting at times to impossibility, of aspirating it, and by reason of the gradual aggravation of the constitutional symptoms; further, the apparent well-being is frequently purely relative. One is surprised upon discovery, at a first puncture, of a pus which looks so infective, to see the patient as well as he is. Nevertheless, as time goes on, bouts of fever recur oftener, anorexia appears, weight is lost, the pulse rate rises, and the patient looks worse.

Inasmuch as the empyæma in these patients occupies usually nearly the whole of one side of the chest, and as the pleura is thicker and more unyielding than in those of the first class, I have found it necessary to do a more complete thoracoplasty than is accomplished by the standard posterior paravertebral operation; so that, as a rule, I remove in three or four stages, at intervals of one to two weeks, the whole of the ribs from the transverse process to the cartilages. For the anterior halves I employ a long vertical axillary incision, curving forward at its lower extremity. Of this type I am able to report upon 7 patients operated on over a year ago; 2 have been given a practical cure, three years and three years and a half after operation; 1 is greatly improved, after two years and a half; 3 are moderately improved, one and a half to two and a half years after operation; and the 7th is growing progressively worse after two and a half years. I should add that in two of the patients there was present a bronchopleural fistula, which means a dangerous complication difficult to close. The one patient who is going down hill had such a fistula, and his empyæma has turned into the grave mixed infection type of the third class. Moreover, of 2 patients operated on during the past year, 1 has died, and he, too, had a bronchial fistula. The other is improved and promises well.

Results such as these must surely be regarded as encouraging. I assume, under correction, that practically every one of the

patients of this class is sure to die sooner or later. Once the empyema has progressed to this stage it is almost hopeless to bring about by repeated aspirations and irrigations a sterilization of the pleura, and a return to simple aseptic pneumothorax. If, then, one can restore two out of six to working life there is legitimate reason for satisfaction.

Mixed Infections.—The immediate cause of these mixed infection empyemata is a double one, in the sense that some represent a sort of culmination of one of the two preceding types, while others are immediately established in a healthy pleura through rupture of a cavity. The effusion contains numerous tubercle bacilli, staphylococci, streptococci, and sometimes anaerobes. The clinical appearance of the patient is well-known. He looks toxic, he loses weight rapidly, has high fever and rapid pulse. He often has an infected sinus in the chest wall at points where punctures have been made. There is usually present a bronchopleural fistula, which was the prime cause of his mixed infection and now leaves but little room for hope that the lung can ever expand. The evolution of the disease is almost certainly fatal within a period which varies with the severity of the infection. It is true that a few live a long time, even several years, especially if repeated aspirations or tube drainage succeed in reducing the fever. Nevertheless, even these ultimately die, while in the majority death occurs rapidly within the lapse of a few months.

This type offers to the surgeon a most difficult problem. One rule seems to be well-established; to wit, that one should avoid, if possible, opening the chest and putting in a drain; that one should begin with frequent aspirations. It is usual to add to this irrigations and the instillation of various antiseptics, of which the favourite ones have been formalin and glycerin, acriflavin, and gentian violet. The French recommend gomenol, of which I have no experience. Irrigations of large quantities of fluid are usually impossible on account of the bronchopleural fistula. My experience is naturally somewhat one-sided, inasmuch as most of the patients referred to me represent the failures of the methods described, which have already been tried by the physician. Nevertheless, I believe that the physician will admit the truth of the general statement that

these temporizing measures rarely succeed. If they do not succeed, and if after some weeks or months the patient is steadily losing, one is forced, in my opinion, to excise a rib and institute open drainage. In some cases, not many, this measure actually does fulfill its purpose. Fever disappears, and the patient is restored to the *status quo ante*, which may have been fairly good. The patient then remains with the pleural fistula, and, having overcome the gross infection, may live for years, though condemned to the drainage tube. After that his outlook depends largely upon the type and progression of his pulmonary disease, and the degree of his resistance. I dispose of an experience of fifteen cases of this class. In 12 of these a costectomy with drainage was the first surgical measure, of which 9 were done by myself and 3 had already been done when they entered the clinic. Of these 12, 8 cases had to be left without further operation, because their later course forbade it, and 7 of these went on to death, while 1, after two years, is going down hill. In the other 7 of the 15, I was able to do, in three or four stages, a total thoracoplasty. Such represent obviously a more favourable group, whose general resistance was so good as to encourage further work. It is clear that the proper proportion is not 7 out of 15, but 7 out of a much larger indeterminate number, who were not referred to me as being hopeless, either with or without drainage. However, in this small group of selected cases the results have not been too bad. Of the 7 there are two who are able to work a full day; 2 who are going about freely, able to work a little, but not needing to work; 1 with the cavity closed and greatly improved, but still under treatment 9 months after operation, and 2 who died in hospital. Two of those alive and comparatively well still have small cavities and have to wear a tube. Concerning the two able to work a full day, one to two years after operation, I have no information as to their being obliged to wear a tube. As to the five living cases it is certain that their condition, even when small cavity has persisted, is very much better than it was before operation, but it is impossible to regard them as permanently cured. If they had been operated on at an earlier stage of their empyema the results would probably have been much better, and

the same is true *a fortiori* of the eight patients who died, at least, of those who possessed original resistance. These patients come to the surgeon too late. Looking at things from the surgical point of view, and considering the very encouraging results of operation in the lighter types of tuberculous empyæma, I point the moral, and would point it with all possible emphasis, that the physician should not delay sending to the surgeon his cases of tuberculous empyæma, as here defined, until they have passed gradually or suddenly into this third stage of mixed infection. A relatively early tuberculous effusion, which, during a period of six months or more, persists in reaccumulating after several aspirations and air refills, should *ipso facto* be treated by an extrapleural thoracoplasty, which alone is able, by the fact of its creating a general pleural symphysis, to prevent the occurrence of the usually fatal mixed infection empyæma. Should a subpleural cavity break outwards later, it will then pass between the ribs and appear on the chest wall as a relatively harmless cold abscess.

The ill reputation of the surgical treatment of pulmonary tuberculosis, which is entertained by many surgeons and by many more physicians, is due in large part, in their eyes, to the supposed fact that operation involves a high mortality percentage. That this is not the case is sufficiently proved by the figures which I have put before you this evening. In a total of 112 cases treated by thoracoplasty, dating over a year ago, and excluding only the grave mixed infection empyæmata, we find an operative mortality of 11.6 per cent. A large proportion of these deaths occurred in patients who were definitely poor risks, and would have died in any case within no long period. This fact emphasizes the necessity of resorting to surgical interference at a much earlier date than heretofore. In the remainder one finds a non-operative mortality of 14.3 per cent, death occurring usually from progressive tuberculosis. Nevertheless, three of these died of causes other than tuberculosis, of whom two had lived six and seven years after operation

practically cured. It should be remembered that all patients chosen for operation are far advanced and have spent long years in medical treatment. The normal evolution of the disease in these patients offers a dark prognosis, and we may be certain that operation has saved and restored to community life a very gratifying proportion. The proportion of practical cures in the total number amounts to 37 per cent and that this practical cure is maintained can be seen from the appended table.

TABLE III.

DURATION OF CURE IN CASES OPERATED ON OVER ONE YEAR AGO BY THORACOPLASTY EXCLUDING MIXED-INFECTION EMPYÆMATA

Year	Number of Cases	Number of Cures
1919-1920.....	6	3
1921.....	4	1
1922.....	9	3
1923.....	12	7
1924.....	14	6
1925.....	15	9
1926.....	24	10
1927.....	22	4
Total.....	106	43

It is also to be remembered that these patients without operation would have been condemned to sanatorium life for the rest of their days, and that if they did go home they would be unable to work and would be a danger to the community. The gain is obviously enormous.

May I, in concluding, make an earnest plea, particularly to the physicians who first see and treat these tuberculous patients, that they should realize it is their duty in the presence of every case of chronic unilateral tuberculosis to consider at an early stage at least the possibility of artificial pneumothorax and of thoracoplasty. Let them at least consult some surgeon who is known to have made a study of the subject (and surgeons with this knowledge are springing up all over the country), because the necessity of close collaboration between physician and surgeon is as imperative in this particular branch of our science as it is, for instance, in that of neurology; and the very remarkable advance which thoracic surgery has made during the past twenty years has been brought about very largely by reason of this close collaboration.

IMPORTANT FACTORS IN THE MANAGEMENT OF HYPERTHYROIDISM*

By GORDON S. FAHRNI, M.D.,

Winnipeg

FOR many years the treatment of hyperthyroidism varied greatly, but, during the past few years, particularly the past decade, the weight of opinion has been swinging strongly toward surgical treatment. Perhaps one reason for this change on the part of many practitioners is the gradual diminution in the danger of surgical treatment, such as the progressively decreasing incidence of severe complications, and the diminishing mortality rate, together with a decrease in post-operative morbidity. An added reason is, undoubtedly, the economic one of shortening the treatment and getting the individuals back to normal as soon as possible. This is particularly the case where the patient is the family bread winner.

Surgical treatment of this disease is admittedly unscientific and its limitations are freely recognized, but until a cause for the disease is discovered, or a more satisfactory form of treatment brought forth, we should concentrate our efforts in the direction of increasing the efficiency of the treatment at hand. With this purpose in view, my remarks will apply chiefly to surgical treatment, and may be considered under three headings: (1) complications; (2) mortality; (3) recurrence.

COMPLICATIONS

Complications following thyroidectomy may be very serious, and the best means to prevent them is to appreciate their danger and develop an operative technique that will reduce their incidence to a minimum. A complication is always more serious in very sick people; for instance, hæmorrhage during or a few hours after operation may not be sufficient to impair seriously the result in the case of a robust individual but be quite enough to turn the scale unfavourably in a very sick patient. For this reason an effort should be made to obtain a maximum degree of improvement be-

fore operation, and in very sick people extraordinary care should be taken to avoid complications, and a fast, accurate, smooth operative technique practised. In bad risk patients a smooth twenty-minute operation may be life saving, whereas a clumsy fifty-minute operation may prove disastrous.

I know of no single factor that has contributed more to the pre-operative preparation of the hyperthyroid patient than the judicious use of Lugol's solution, as popularized by Plummer. Yet, I should like to express myself as very much opposed to the indiscriminate, periodical, and sometimes prolonged use of iodine in hyperthyroidism. This practice takes from the surgeon his most powerful weapon, as it is well known that a patient, after his first favourable reaction to iodine, (the optimum operative period) may relapse at a later date, after which iodine seems to be much less efficient, and the patient will accordingly be a more serious operative risk. I have in mind several cases of Graves' disease, who, after being treated with Lugol's solution for several months in varying doses, each experiencing the initial improvement, relapsed later, and went into a severe form of hyperthyroidism with diarrhœa and vomiting for some days before death. I saw these cases in consultation after their relapse and at no time after that could operation have been considered. Had the iodine in these cases been given as a pre-operative measure the operation would have been carried out after the initial improvement had appeared.

Hæmorrhage is one of the commonest complications of thyroidectomy. Complete hæmostasis should be obtained before the wound is closed, and should be tested by coughing or straining by the patient. Secondary hæmorrhage will occur only following infection of the wound, usually in the form of cellulitis of the surrounding tissue.

Injury to a recurrent laryngeal nerve may be

* Read at the annual meeting of the Ontario Medical Association, Hamilton, Ontario, May, 1929.

a very serious complication. The position of the nerves should be thoroughly understood and then avoided. This can be done safely even in the most radical type of thyroidectomy. When one of these nerves is ligated or caught in a hæmostat the patient usually responds with immediate inspiratory dyspnoea. If he is then asked to talk the error becomes obvious and the ligature or forceps may then be released. If one is not warned by such a sign the error in technique may not be recognized until some time later, when it is too late to correct it. There is no more distressing complication than a bilateral abductor paralysis of the vocal cords, sometimes requiring a hurried tracheotomy to prevent death.

Tetany is, fortunately, rather rare, and can best be avoided by leaving intact a considerable portion of the posterior capsule of the thyroid on both sides of the trachea. This can be done without sacrificing any of the radical features of the operation, and such technique has the added advantage of protecting the recurrent laryngeal nerves. I have not seen a case of tetany or nerve injury in my last eleven hundred thyroidectomies.

Acute post-operative hyperthyroidism is very rare when the patient previously has been thoroughly iodized. Pneumonia and embolus are both to be feared, but I know of nothing new in their prevention or treatment.

MORTALITY

In order to establish a basis on which to work I submit a list of the 8 deaths in the last 844 consecutive thyroidectomies which I have done since I last reported my mortality rate. This makes a mortality rate of 8 in 844, or 0.92 per cent.

CASE 1

A woman, 60 years of age, complained of the characteristic symptoms of hyperthyroidism. She had a large bilateral adenomatous goitre; pulse rate 104 to 120; blood pressure, 190-90; heart, definitely enlarged; basal metabolic rate after one week in bed, plus 68 per cent, a few days later, plus 60 per cent. She had suffered from a cerebral hæmorrhage eighteen months previously, which caused a hemiplegia from which she had since almost completely recovered.

Three weeks' rest in bed, with Lugol's solution, during the last week brought her basal metabolic rate down to plus 45 per cent, and at this time I did a bilateral resection of a fairly large adenomatous goitre. Following the operation she seemed fairly well, but during the night her pulse became weaker, and the following day she steadily became worse and died at

5 p.m., thirty-two hours after her operation. There was no hæmorrhage nor any sign of hyperthyroidism. She died apparently of a failing heart.

CASE 2

A young woman, 27 years of age, presenting an advanced state of exophthalmic goitre, had been sick for more than a year, and had a massive diffuse vascular goitre, protruding eyes, with great loss of weight. The heart was greatly enlarged; basal metabolic rate, plus 80 per cent; pulse 160; blood pressure 160-60; the legs were swollen, and there was some general œdema. Stereoscopic x-ray plates showed a greatly enlarged heart. The woman had taken Lugol's solution over a period of months. I kept her in bed for three weeks and then ligated both superior thyroid arteries. She was sent home to rest, returning three months later somewhat improved, but still quite sick. After further preparation, the right lobe alone was removed. The patient seemed quite well for twenty-four hours, then developed a typical form of acute post-operative hyperthyroidism and died twelve hours later in a thyroid crisis. This woman had received iodine therapy freely before operation, but responded poorly since she had been using it for some fifteen months.

CASE 3

A woman, 39 years of age, had been an invalid for eight years. She developed influenza during the epidemic of 1918 and following this exophthalmic goitre supervened. The following year part of one lobe was removed, which, she said, did her little if any good, and she had since spent most of her time in bed. I was called to see her six years later by her family physician, who was hurriedly called because she appeared to be choking. Examination revealed a massive goitre, mostly one-sided, with a great displacement of the thyroid cartilage and trachea to the opposite side. She was taken to hospital, where well marked hyperthyroidism of the exophthalmic type was found to be present, with profound loss of weight and a greatly enlarged fibrillating heart. The basal metabolic rate was plus 56 per cent. There was a complete paralysis of the vocal cord on the side corresponding to the lobectomy six years previously. Breathing improved slightly, but continued quite stertorous owing to pressure on her trachea. We kept her for a few days and decided to make an effort to remove the massive left sided goitre. This was done, but the patient died two hours after the operation. I am unable to state the cause of death, but it was probably from exhaustion and failing heart muscle in a very "bad risk" type of case.

CASE 4

This was a frail little woman, 51 years of age, with well marked exophthalmic goitre of some twelve months' duration. The pulse was consistently more than 150 per minute. The basal metabolic rate, on repeated tests, ran from plus 80 to 90 per cent. After ten days' preparation, ligation of both superior thyroid arteries was done. Ten days later the patient was sent home to rest. Three weeks later she developed a cerebral hæmorrhage, causing hemiplegia, which after eight months had almost entirely disappeared. Her goitre in the meantime had become larger. She was again iodized and removal of the right lobe and isthmus was done. She did very well for three days, then developed signs of a failing heart and died two days later.

CASE 5

This was a woman, 54 years of age, with well marked exophthalmic goitre. Thyroidectomy was done. Two days after operation broncho-pneumonia developed

and she died two days later. The findings were confirmed at autopsy.

CASE 6

A man, 62 years of age, with a very large adenomatous goitre and hyperthyroidism of thirty years' standing. A few months before consulting me he had had a cerebral hæmorrhage or embolus causing aphasia with mild paresis of one arm and one leg. This had greatly improved and speech had fairly well returned. He had a very large heart and auricular fibrillation. After the usual preparation, a bilateral resection of a very large adenomatous goitre was done, and during the day and evening the patient looked and felt well. Eighteen hours after the operation he became somewhat restless and cyanosed, his temperature went up to 104° F., and he died in this state the following day. He presented a picture very typical of acute post-operative hyperthyroidism.

CASE 7

A boy, 13 years of age, who when I first saw him, was an advanced case of exophthalmic goitre with a large, vascular, bilateral goitre. Basal metabolism was plus 75 per cent, and other findings were in keeping with this reading. He had been taking Lugol's solution for eight months, and had been getting worse the past few months. I left him for several weeks on rest and continued iodine treatment. He seemed to improve a little only, and I then did a bilateral radical resection of the goitre. He seemed none the worse for twelve hours, but after this he developed an acute thyroid crisis. His temperature went to 105° F., the pulse was 166, and he died the same day from what seemed to be acute hyperthyroidism.

CASE 8

This was a woman, 60 years of age, with well developed toxic adenomatous goitre of the intrathoracic type, and symptoms dating back several years. The basal metabolic rate was only plus 35 per cent. Pulse, 124; blood pressure, 174-90.

The adenomatous goitre was removed after the usual preparation, and the patient did well for two days, when she complained of pain in her chest, with a temperature of 103° F. She developed all the signs of a broncho-pneumonia and died two days later.

In these 8 deaths in 844 consecutive thyroidectomies, I would like to call attention to the fact that three of them had within eighteen months previously suffered from cerebral hæmorrhage. In the other 836 cases, none had a history of cerebral hæmorrhage. This to me is significant, and would suggest careful consideration before operating on toxic goitres following a history of cerebral hæmorrhage. Two of the 8 deaths were from broncho-pneumonia, neither of them in the cases giving a history of cerebral hæmorrhage. Three of the 8 died apparently from post-operative hyperthyroidism. One of these was an old case of adenomatous goitre; another was a long standing exophthalmic goitre. Both of these patients had been using Lugol's solution for many months. I am of the opinion that these two cases might still be alive had they been

operated upon during their first improvement under the use of Lugol's solution.

I believe that prolonged hyperthyroidism is always a grave condition and the longer the disease has existed the greater the operative risk. The age of the patient is another important factor. Long-standing hyperthyroidism in old people is always a serious type to deal with. In the group of cases under review, five out of the eight deaths were in people more than fifty years of age, whereas the whole eight cases had been sick for a period of time ranging from one to thirty years.

In this series, no cases were refused operation. All bad cases were accepted, and an effort made to bring them into an operable condition, for the reason that many of the worst cases of advanced hyperthyroidism, with well marked heart failure, have been operated upon, and later these people have been able to carry on fairly well in their normal spheres of life. Were it not for these encouraging results many of the bad risk patients would be classed in an inoperable group, and our operative statistics would then show a still greater improvement in the mortality rate, but I should feel that surgery was not being used to the best advantage. In this series, all the deaths were in very sick patients who were recognized as being serious operative risks. In this group, the largest number of cases done consecutively without a death was 250, which only goes to show the importance of numbers in arriving at accurate statistics.

RECURRENCE OF GOITRE FOLLOWING THYROIDECTOMY

Any surgeon who has been doing considerable goitre work over a period of years has had the disagreeable experience of meeting with a recurrent goitre, with accompanying hyperthyroidism, following what appeared to be a satisfactory cure from thyroidectomy.

The recurrence may manifest itself first a few months after thyroidectomy, or as late as many years following the operation. Graves' disease is the type of goitre most liable to this late complication. When the patient first returns for advice, the chief complaint is usually one of enlargement of the thyroid stumps, and this finding is what alarms the patient and causes him to hurry back to the surgeon, although defi-

nite evidence of varying degrees of hyperthyroidism will usually be found. When the patient is questioned, it will be found that some months before the tumour in the neck was seen many of the old symptoms were experienced, such as restlessness, irritability, palpitation of the heart, dyspnoea on exertion, fatigue, and some loss of weight. I wish to point out that had the patient at this period received suitable treatment the goitre in all probability never would have developed. The treatment proposed is the administration of Lugol's solution in comparatively small doses, ranging from 5 to 10 minims twice daily, the dose being gradually diminished as the symptoms recede. Should there be the slightest recurrence of symptoms any time later, iodine should again be given, and for some time after all symptoms have disappeared. In these cases, it would appear that there is a physical state—call it iodine starvation if you will—that causes the general symptoms, and if this physical condition is allowed to persist it acts as a stimulus to hyperplasia of the thyroid stumps and a well marked goitre is soon developed. With this excess thyroid tissue present, iodine has not the curative effect previously noted, and a secondary operation for removal of the goitre will usually be necessary before a cure is established.

Marine states that the first pathological change in the thyroid tissue in the formation of colloid goitre is hyperplasia, and that if the iodine content of thyroid is kept at or above the normal minimum (0.01 per cent) this primary hyperplasia will not occur; hence the goitre will not develop.

It is probable that a somewhat similar condition exists in these cases of recurrent exophthalmic goitres, but with this difference, that when the iodine content of the remaining thyroid tissue falls below a normal minimum symptoms are produced. If iodine is then given to the patient, the iodine content of the thyroid tissue is raised and the symptoms disappear, but if iodine is still withheld the thyroid tissue responds by undergoing hyperplastic changes and symptoms increase in intensity; and when a well marked goitre has reappeared the excess of thyroid tissue acts in the same way as in the ordinary case of exophthalmic goitre before any operation has been done. This hypothesis might even be carried further and applied to the

original etiology and onset of exophthalmic goitre, and we might ask ourselves whether iodine given during the first appearance of symptoms of hyperthyroidism could arrest the disease and prevent thyroid hyperplasia. If this hypothesis could be substantiated in practice the prevention of exophthalmic goitre would then be in sight, and iodine would have scored again in preventive medicine.

It has been my practice to give Lugol's solution in all cases of Graves' disease for two to three and a half months following thyroidectomy, in gradually diminishing doses, and to instruct the patients that if any of the old symptoms recur after Lugol's solution has been discontinued, they should resume its use gradually weaning themselves of the medicine as they find no tendency to recurrence of the symptoms without its use. I have had no recurrence of goitre in the past few years in patients that have co-operated in this way, but I have repeatedly seen patients who have consulted me some months or a few years after operation complaining of symptoms only, with no evidence of thyroid enlargement. In these cases all symptoms have disappeared when the treatment suggested was carried out. The recurrent goitres that I have seen from my own practice fall fairly well into a non-co-operative group, typified by the following case:

Mr. R. consulted me on October 25, 1927, a well marked case of exophthalmic goitre with all the typical findings, including well marked exophthalmos and a basal metabolic rate of plus 52 per cent. He was put to bed and given Lugol's solution and improved promptly. On November 3rd, nine days after his first appearance at my office, I did a radical bilateral resection of a moderately large vascular goitre. His convalescence was uneventful. Two weeks after operation he was in my office feeling very well, and as he stated entirely free of symptoms. He appeared as instructed two weeks later quite well, and, although he had the usual instructions to report later and to continue the use of Lugol's solution, he did not appear again until April 2, 1928, five months after operation, complaining of a recurrence of his old symptoms, loss of weight and strength, irritability, free perspiration, and pounding of his heart. When I asked him why he had not returned sooner, he stated that he had felt perfectly well, had gone back to his work of organizing a new business, had worked hard, and after leaving my office three and one-half months previously had discontinued the use of iodine and had taken none since.

Examination revealed a nervous, fidgety man, with a moist skin, marked tremor, a pulse rate of 134, with, in short, all the manifestations of hyperthyroidism. There was, however, no visible or palpable evidence of an increase in size of the thyroid stumps. I advised him to rest for ten days and take Lugol's solution, ten minims twice a day, and then report back for re-

examination and advice. His next appearance was on November 28, 1928, nearly eight months later, when he complained of recurrence of his old symptoms once more, but also of enlargement of his neck. He stated that when he resumed the iodine eight months earlier all his symptoms disappeared, and he resumed work, but discontinued his medicine. A few weeks after this his symptoms reappeared, but he kept on working, disregarding them, and had returned because he had recently noticed the goitre reappearing and getting steadily larger. Examination revealed a well marked bilateral firm growth on either side of upper trachea, undoubtedly a hyperplastic goitre, with all the manifestations and findings of well marked hyperthyroidism. I advised him to rest for a time, and once more gave him Lugol's solution. He improved and resumed work ten days later, but to a restricted degree. He reported to my office every two weeks during the winter, but the goitre became no smaller and hyperthyroidism persisted. I then advised a secondary operation, and on March 13, 1929, removed both lobes and what I could find of the isthmus, leaving only shreds of thyroid tissue attached to adjacent structures. He reacted more profoundly to this than to the first operation, chiefly, I think, because, as already stated in this paper, the greatest resistance to operative interference in hyperthyroid patients is established during the first eight to twenty days after the initial use of iodine. This patient made an uneventful recovery and seems quite free of symptoms up to date. He went back to work four weeks after his operation. He is, of course, still using iodine. I think that had this man co-operated in the matter of reasonable personal care, and taken Lugol's solution as advised, he never would have developed the recurrence, and even after the first recurrence of symptoms, I think his co-operation in this respect would have prevented the regrowth of his goitre.

I should like to urge that thyroidectomy should be considered only a step, probably the major step, in the management of Graves' disease, and the patients should thoroughly understand this, and be carefully coached in the importance of co-operation following their immediate post-operative convalescence. Undoubtedly, a fair degree of rest and a limited amount of work and responsibility should be indulged in, but abstinence from these may be carried too far, and I prefer to permit patients to resume work comparatively early, and have

them happy, rather than idle and discontented. When they first resume work they should spend long nights in bed and rest as much as possible. This will tend to compensate for the energy lost at work. The type of operation performed has a definite bearing on the clinical result. I have been accustomed to perform a fairly radical operation, leaving only a small amount of thyroid tissue. This favours complete recovery and in such cases the judicious post-operative use of iodine together with an orderly even mode of living should prevent any recurrence.

There is another type of case however, one who has had insufficient thyroid tissue removed, and in this case we often see persisting morbidity which gradually increases and the goitre may soon reappear. In such a case it is doubtful whether we should expect iodine to prevent aggravation. The mistake was an operative one.

It is difficult to know just how much thyroid tissue to leave in each case, especially since the pre-operative use of iodine has caused such marked changes towards involution in the character of the thyroid tissue, bringing about a disproportion between clinical and histological findings as we were accustomed to find them previous to its use. In thyroidectomy for Graves' disease, I favour erring on the side of radicalism, preferring to cure the patient of hyperthyroidism and take the small chance of resulting hypothyroid function which when seen is usually quite transient, rather than remove too little thyroid tissue and leave the patient improved only, with all the added probabilities of a recurrence of severe hyperthyroidism.

THE COMPLEMENT-FIXATION REACTION IN RABIES.—A. C. Marie and A. Urbain have examined the serum of a rabbit immunized against rabies for the presence of sensitizing antibodies. The serum, after filtration through a Chamberland L3 candle, was found to neutralize ten times its volume of a 1 in 100 suspension of fixed virus, whereas normal serum was unable to neutralize even one volume. Precipitins were demonstrated by mixing the serum with a 1 in 100 suspension of virus, which had been filtered through paper. To show the presence of complement-fixing antibodies two antigens were used. The first, a cocto-antigen, was prepared by grinding up a rabic brain in ten times its volume of saline, heating to 100° C. for half an hour, centrifuging, and removing the supernatant fluid; the second was prepared by grinding up the finely pulverized brain in nine volumes of saline, leaving overnight in

the ice-chest, and pipetting off the supernatant fluid. Using the cocto-antigen it was found that, though 10 units of complement were fixed in the presence of a rabic serum from an animal immunized against rabies, the same result was obtained with a suspension of a normal or a herpetic brain. On the other hand, using the unheated antigen, a specific reaction was obtained; the rabic brain in the presence of an antirabic serum fixed 150 units, and in the presence of normal rabbit serum only 15 units; a herpetic or a normal brain in the presence of an antirabic serum fixed 30 units, and in the presence of a normal serum 15 units. It would therefore appear that an antirabic serum contains neutralizing antibodies—the latter being demonstrable by a fresh but not by a heated antigen.—*Brit. M. J.* 2: Epit. 36, Sept. 7, 1929.

VACCINATION AND ENCEPHALITIS*

BY R. D. DEFRIES, M.D., D.P.H., AND N. E. MCKINNON, M.B.,

Toronto

MYELITIS, or encephalomyelitis, following such diseases as measles, smallpox, chickenpox, mumps, and other acute infections, has been recognized for many years. Barlow, in 1887, reported a case of rapidly ascending myelitis in a young man twenty-three years of age, ill with measles. The onset of the myelitis was on the ninth day after the onset of symptoms of measles, and six days after the appearance of the rash. He quoted an earlier case, reported in 1790. The occurrence of myelitis in the course of smallpox has been reported by numerous observers. In varicella, also, myelitis has been described repeatedly, a review of the reported cases having been published recently.⁴

In 1917 Von Economo published a report of a small outbreak of an acute nervous disease to which he gave the name encephalitis lethargica. This name was given as the lethargic state was the most striking symptom of his cases. Within the following year sporadic cases were recognized in other countries, including France, England, and Holland. The incidence of this disease increased steadily in England, reaching a maximum of 5,039 cases in 1924. In Canada sporadic cases have been recognized from time to time, and two severe epidemics occurred in Winnipeg in 1919 and 1921. The clinical picture of encephalitis lethargica as it occurred in various outbreaks has varied greatly. Outbreaks were reported in which the characteristic lethargy was almost completely absent, and replaced by delirium or insomnia. The name, therefore, of encephalitis epidemica is to be preferred as more expressive of the nature of this disease. In spite of intensive investigations, clinical and research studies, there is no agreement regarding the causative agent. That the disease, however, is communicable has been definitely established.

The focusing of attention on this disease may have been a factor in the more general recogni-

tion during recent years of encephalitic complications in certain infectious diseases. Such complications are now apparently of fairly frequent occurrence. For example, Neal and Applebaum saw eight cases of measles-encephalitis in 1926; and record four others which they had seen in the previous eight years; Lust (1926) wrote that recently, within a period of three months, he came across four cases of measles-encephalitis, and that at a time when measles was not at all prevalent; Schick (1926), who also had four such cases, three of which were fatal, was of opinion that measles lowered the resistance to attack and invasion by a neurotropic virus.

POSTVACCINAL NERVOUS DISEASE

The striking observation was made that among the cases of encephalitis occurring in London and its environs from November 14th to December 15th, 1922, eleven cases had been vaccinated recently; four of these died, and the pathological picture in three was studied minutely by Turnbull and McIntosh.⁵ These observers recalled a similar pathological picture seen by Turnbull in 1912 in the central nervous system of a boy, who, after a recent vaccination, had shown signs and symptoms indicative of disease of the central nervous system, and which at the time was diagnosed poliomyelitis. The picture was, in their opinion, distinctly different from that of poliomyelitis or encephalitis lethargica. In the following year, 1923, under the influence of a special inquiry instituted by the Ministry of Health, fifty-three cases were recognized in England. No other cases were reported till April, 1925, and from that date till February, 1926, only five cases were recorded. From February, 1926, to December, 1928, about ninety cases have been reported, but the diagnosis or relationship to vaccinia has not been investigated in all these. Lucksch, of Prague, in 1924, reported the occurrence of fatal encephalitis following vaccination in three children in whom the encephalitic symptoms developed ten days after vaccination. Bastiannse reported the oc-

* Department of Epidemiology and Biometrics, School of Hygiene and Connaught Laboratories, University of Toronto.

currence in Holland, in 1924, of a case of encephalitis following ten days after vaccination, and subsequent investigation has brought to light one hundred and twenty-four cases, with thirty-eight deaths, in Holland from 1924 to August, 1927. Sporadic cases have been reported in Portugal, France, Switzerland, Poland, Austria, Czechoslovakia, Italy, and other countries. In the United States about ten possible cases have been reported; in some of these the diagnosis has been formulated retrospectively. No cases have been recorded so far in Canada.

THE CLINICAL PICTURE

The clinical picture of the observed cases of postvaccinal encephalitis is as varied as that of encephalitis epidemica. The very excellent description published by Armstrong⁸ affords a good picture of the various phases of the malady:

The symptoms in this complication usually appear suddenly and have their onset in 70 per cent of the cases from the tenth to the thirteenth day, inclusive, following vaccination. That is, they appear when the vaccination, usually primary, is at its height.

The symptoms as recorded for different cases vary somewhat, but four symptoms are quite constantly noted, namely: (1) fever (104°F., or higher in severe cases); (2) vomiting; (3) headache; (4) stupor or coma.

The stupor may develop within a few hours after the onset of the symptoms and is always present in fatal cases.

Symptoms of meningeal irritation are usually present in conscious cases, absent in others. Convulsions are common in young children, as are also cramps or spasms. Trismus has been occasionally observed, and is worthy of note, as it may lead to confusion of the ailment with tetanus. Varying degrees of paresis or paralysis are noted in some cases. The eye muscles usually escape. The Babinsky is usually positive, a point considered as of high diagnostic significance. The spinal fluid usually shows little or no change by chemical, microscopical or bacteriological studies. The pressure may be slightly increased, however, and cell counts as high as 200 to 400 have been observed.

Death, which follows in from 30 to 40 per cent of the cases, usually occurs from the third to the tenth day following the onset of symptoms. Recovery, when it takes place, is usually rapid and complete; however, some degree of crippling has been noted in a few cases.

PATHOLOGY

Careful study of the limited pathological material has been made by Turnbull, Perdrau and others. The lack of agreement and the various interpretations of the findings indicate an uncertainty in the minds of the pathologists as to the identity of the disease and its possible relationship to poliomyelitis, encephalitis lethargica, vaccinia, or other acute infections.

In the gross, there may be no evidence of any pathological condition; slight flattening of the

convolutions due to œdema has been recorded, so too, congestion, very occasional small hæmorrhages; and, according to Perdrau,⁷ softening of both brain and cord in small areas can be recognized in some cases. Microscopically, perivascular mantling may be found as in encephalitis lethargica, and in as haphazard a distribution, but according to Perdrau the primary and essential lesion is an acute demyelination in the neighbourhood of the blood-vessels, both in grey and white matter, though affecting the white matter more. Secondary to this there occurs a proliferation (or infiltration) of cells which are apparently of glial (microglial) origin for the main part. This extra-adventitial lesion is not found, according to Perdrau, in encephalitis lethargica. An infiltration in the perivascular space is chiefly lymphocytic in character, with few plasma or plasmacytoid cells, and only an occasional polymorphonuclear cell. In the more prolonged cases macrophages, or endothelial phagocytic cells, have been described. Perdrau points out that this picture of acute demyelination is not one peculiar to postvaccinal encephalitis, but is found in encephalitis occurring during measles, smallpox, varicella, and other acute infections. It is similar, too, to the picture found in certain cases of paralysis following the Pasteur treatment.

EPIDEMIOLOGY

Three commissions have investigated the subject of postvaccinal encephalitis. The first committee, under the chairmanship of Sir Frederick Andrewes, was appointed in England in November, 1923, and reported in May, 1925.¹ A second English committee under Sir Humphry Rolleston² presented its report on the whole question of vaccination in July, 1928. A committee of the Health Organization of the League of Nations, under Professor Ricardo Jorge, Director General of Public Health Services, Lisbon, met at Geneva in August, 1928.³ These committees have studied all available data.

From the epidemiological studies certain findings of importance have been made. These may be briefly reviewed as follows:

Distribution.—The relative absence of cases in one country, as in Denmark, and the prevalence in neighbouring countries, as in Holland and England, is striking. Rural communities and small villages have suffered to a greater

extent than cities. A distinct tendency for cases to occur in small groups, occasionally more than one in a family, has been noted.

Age.—The incidence and mortality has been definitely higher in older children of the 6 to 14 age group than in infants and adults. A few cases have been reported in infants, but the relative freedom of this group from encephalitis as a complication is a fact of great practical significance in the practice of vaccination.

Possible Relation to Other Communicable Diseases.—No definite relationship has been shown to exist between cases of postvaccinal nervous disease and the occurrence of outbreaks of poliomyelitis or encephalitis epidemica, although in some instances these diseases were occurring in the community simultaneously. In fact, the early cases in Holland, on account of this association and their pathology, were thought to be true cases of epidemic encephalitis. Subsequent surveys in other countries have not shown any such association constantly.

Possible Relationship to Vaccination.—Study of the cases, in which by investigation other diagnoses were eliminated and recent vaccination confirmed, has shown that 70 per cent had the onset of nervous complications from the tenth to thirteenth day after vaccination. Practically all the cases occurred after primary vaccinations. In all the cases the vaccination ran an apparently normal course, the site not showing any evidences of unusual inflammation or delay in healing. (It must be remembered that four large insertions have been, until now, the usual practice in vaccinating in England. Similarly, in Europe, vaccination has been performed using larger areas of insertion, and with greater trauma than is the practice on this continent.) There does not appear to be any particular relationship to any one strain of vaccine virus. In Holland, which suffered most severely, vaccine was obtained from many sources, including Denmark, in which country no cases had occurred. When the Danish vaccine was used, cases continued to occur as frequently as when vaccine prepared in Holland was used. As well as the constancy of the onset of symptoms about the tenth to twelfth day after vaccination, another fact that tends to show an apparent relationship to vaccination is that in one hundred and six cases reported as encephalitis lethargica in Holland in 1926, it was found

on enquiry that thirty-six gave a history of recent vaccination.

On such findings the investigating committees had to base their conclusions. It is not surprising, therefore, in view of the very few cases that have occurred, and the complexity of the findings, that complete agreement was not attained. There was agreement, however, that the condition was definitely related to vaccination, the constancy of the incubation period being evidence of that relationship. But, with one dissenting voice, there was agreement that vaccine virus was not the causative agent, but acted in some way, as it was suggested measles may act, in lowering the resistance to some other virus. The hypothesis that the causative agent is widely disseminated among the people in the countries in which the disease has appeared, but is capable of causing disease only under the influence of some other agent such as measles, smallpox, mumps, or vaccinia, was formulated by the Andrewes Committee as the most probable explanation of postvaccinal nervous disease. In this the later committees concurred.

This hypothesis receives strong support from the failure to find any one strain of vaccine more involved than others; from the fact that persons vaccinated with one lot of vaccine showed no encephalitis, whereas persons in another district, of similar age groups, and vaccinated with the same vaccine showed occasional cases of encephalitis; from the grouping of cases in contrast to the general distribution of the vaccine; from the greater incidence in children of school age than in infants, as school children come into contact with more varied environmental factors than infants; and from the fact that cities were less affected than rural communities.

CONSIDERATIONS INVOLVED

Certain countries, in which the condition has occurred, have altered the regulations in regard to compulsory vaccination. Holland has temporarily suspended compulsory school vaccination. The Minister of Health of England and Wales has advised that compulsory vaccination of children of school age, or adolescents, should not be enforced, unless there has been contact with smallpox. In accordance with the recommendation of the Rolleston Committee that "in place of the officially advocated four insertions

trial be made of vaccination and revaccination in one insertion with a minimum of trauma," the Ministry has so altered the regulations.

A proper vaccination to-day is one which presents a vesicle of less than $1/2$ inch in diameter with a final scar no greater than $1/4$ inch in diameter. This is accomplished by vaccinating with the least possible trauma and the omission of all dressings. The least possible trauma is produced when a short scratch $1/16$ inch, or a single puncture, or any of the recent modifications of these fundamental methods, is used. The expression "scratch method" even when the word "short" is linked with it is apt to give a wrong idea of the actual procedure. The sterile needle, being held firmly at a slight angle to the prepared skin, is pressed against the surface at the same time pulling the point downward for the shortest possible distance. When carried out in this manner a minute scratch of about $1/16$ inch is produced, roughly about the size of a printed comma on this page. The vaccine is then expelled from the capillary tube and gently rubbed into the scratch using the side, not the point, of the needle. In our experience this method gives most satisfactory results.

If the vaccinator knows that the vaccine is fresh or that it has been kept properly in a refrigerator and is not out-dated, one insertion is satisfactory. The many opportunities for deterioration of the virus in shipment over long distances and in inadequate after-storage render it expedient in Canada to make two insertions, particularly in the rural districts where observation and the opportunity of a second vaccination, in case of failure, are not readily obtained. In our experience two small lesions well separated so that they do not coalesce, give rise to no greater discomfort than one, and heal as readily, with much less chance of complications than a single larger lesion produced by abrading a larger area, or by multiple punctures. In revaccinations the two insertions⁹ one by the short scratch and one by the puncture method, have advantages in giving a reaction more easily read, and, at the same time, increasing the possibility of getting a definite "take."

Certain other points which have long been recognized merit added emphasis at this time. As far as possible no one, child or adult, should be vaccinated when suffering from any infection.

Vaccinia itself is an infection and should be treated accordingly; that is, the vaccinated person should not be submitted to undue fatigue, or exposure to untoward conditions, and should be strictly under the care and direction of the physician, not only in performing the vaccination, but until the lesion is properly healed. And until the question of postvaccinal encephalitis is further elucidated, vaccination should not be performed when poliomyelitis, encephalitis, or such other acute infection is epidemic. The importance of performing vaccination in infancy has been recognized in the past, but in the light of the findings of these commissions it merits additional emphasis on account of the great rarity of any complications at this period. Revaccination early in school life and again on leaving school affords an immunity of high degree, probably for life, and the individual is thus given the maximum protection with, at the same time, the least inconvenience and the least possible chance of complications, cerebral or otherwise.

No cases of this condition have been reported in Canada, and but very few cases in the United States. Should it occur in this country, it is desirable that the health authorities should be notified immediately in order that all aspects of the situation may be thoroughly investigated. If the hypothesis as to the cause advanced by the commissions, is correct, and if we are to profit by the experience of others, and avert, if possible, the occurrence of the malady here, vaccination should be performed with due regard to the precautions noted.

The question of the necessity for vaccination and revaccination has not altered. In spite of the mild smallpox with which Canada has become acquainted in the last few years, it is only necessary to recall the Windsor experience with smallpox in 1924—32 deaths among 67 cases—to show its importance. "None of the facts considered in this report", concludes the Andrewes Committee, "lead the commission to the conclusion that there is any reason for discontinuing the use of vaccination, which remains the most powerful weapon against smallpox that we possess."

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THE TREATMENT OF DIABETIC COMA IN CHILDREN*

By GLADYS L. BOYD, M.D.,

Toronto

DIABETIC coma is one of those conditions in which the difficulties of the situation have been so stressed that a paralyzing fear has been engendered which prevents the inexperienced from making any effort to treat it. The truth of the matter is that while some cases present well-nigh insurmountable problems, and most are, perhaps, better treated in hospital, many could be successfully treated at home if the basic principles of their treatment were borne in mind, and, better still, simple preventive measures would save most patients from ever going into coma.

The reports from some clinics suggest a decline in the incidence of diabetic coma and a generally low morbidity among children. The figures obtained at the Hospital for Sick Children, Toronto, bear out neither of these statements. During the past six and one-half years, since insulin became available for treatment, 51 comatose cases have been admitted to this hospital. In all the coma was sufficiently severe that the patient was unconscious at least part of the time, had some degree of hyperpnœa, and was unable to take fluid by mouth. Many others in an acidotic or precomatose state were admitted but are not included in this number. This rather high incidence is not explained by repeated attacks in a few individuals, as it included forty-two different patients. In nearly half of the number, coma occurred at the onset, or at least at the first recognition of the illness. In the remainder it resulted from dietary indiscretions, infections, the sudden discontinuance of insulin,

or a combination of these factors. In those patients in whom coma first led to the diagnosis of diabetes, a recognition of the symptoms of the disease and its rapid progress in childhood would have prevented coma in many and death in some. However, in the majority of cases admitted the nature of the illness was not even recognized when coma developed, but they were sent in as uræmia, laryngeal obstruction, acute abdominal conditions, or were not diagnosed at all.

Possibly one reason why greater concern is not felt about the development of coma is the feeling of safety that insulin gives. This faith in insulin is justifiable to a reasonable extent, but there are limitations to the chances it allows one to take. No one disputes the potency of diphtheria anti-

TABLE I.
The Effect of Delay in Treating Diabetic Coma on its Mortality

Time	Number of Cases	Number of Deaths	Per Cent Mortality
0-24 hours	15	0	0
24-48 hours	10	2 (d.pneu.)	20
48-96 hours	17	8	41
5 hours or longer	9	7	77

toxin, but we respect the fact that its effectiveness is greatest when it is given early. The time element is just as important in the insulin treatment of coma. It was somewhat disappointing, in studying the cases admitted to the Sick Children's Hospital, to find that patients in coma were not being admitted at any earlier stage of their illness now than four or five years ago. Closer study shows, however, that the late admissions now are more often treated cases who have dis-

*From the Laboratories of the Sub-Department of Pædiatrics, University of Toronto, and the Wards of the Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.B.
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continued their insulin without any indication for doing so, and apparently have almost deliberately allowed severe symptoms to develop before seeking aid. The effect of delay in starting treatment is shown in the table.

Mortality rates in diabetes, as shown in insurance statistics, have not fallen as consistently as it was anticipated they would following the discovery of insulin. Diabetic coma, with or without infection, remains the chief cause of death; 80 per cent of the fatalities among our cases were attributable to it. It is somewhat disconcerting to find among our hospital-treated cases that the steady fall in the death rate, which started in 1923 at 60 per cent and reached its minimum in 1927 with 12 per cent, has been succeeded by a rise to 25 per cent in 1928, and by another higher still so far this year. Consideration of the fatal cases of the past two years shows them to belong first to an increasing number of careless, overweight diabetics, who have more or less invited trouble and then delayed seeking help until too late, and, secondly, to those in whom there has been a coincident infection of sufficient severity to have itself caused death.

A few words might be said here of the symptomatology of diabetes and coma in children, as failure to diagnose the disease is responsible in many instances for the failure to institute proper treatment in time. Symptoms of the disease so frequently become evident following an acute infection that many regard the latter as the causative factor. In others, while focal infections are present, one is at a loss to account for the development of the disease. The appetite is usually good, sometimes excessive, and in spite of this the child fails to gain, or even loses weight. Polyuria and polydipsia are present in varying degrees, the former often appearing as enuresis. Constipation is usually marked. In babies and young children, failure to thrive and constipation, in spite of frequent changes of food, are often all that are noted, the degree of emaciation to some extent protecting the infant from more acute symptoms for a time. In others, acute symptoms of acidosis, such as abdominal pain, vomiting, and hyperpnoea, are the first noted. Such patients may die within a week of the onset, so rapid is the progress of the disease if unchecked. Rapid loss of weight occurs in the acidotic. Their abdominal pain and the associated rigidity and coffee-ground vomitus are very suggestive of an acute abdominal condition. The degree of

drowsiness is not a very good indication of the severity of the coma, so that any degree of stupor, even if it is inconstant and the child is fairly bright in the interval, should be regarded as needing immediate attention.

Treatment may be discussed under two headings, *viz.*, preventive, and curative. The former still remains the best in spite of the great change insulin has made possible in the latter.

The first step in the preventive treatment consists in the early diagnosis and adequate treatment of all cases of diabetes. The latter is essentially the provision of a suitable diet, or diet plus insulin, to make and keep the patient's blood sugar normal and maintain this weight at or a little below normal. The fat diabetic is a poor risk, and his chances of recovery from coma greatly lessened should it develop. Even when treatment is not started for some time after acidotic symptoms develop the emaciated diabetic has a fair chance of recovery. Secondly, the adequate removal of all foci of infection not only exerts a beneficial effect on the course of the disease but simplifies treatment, because of the greater freedom from intercurrent infections that eradication permits.

A word may be said here about the proper treatment of infections, when they do develop, as their improper handling often precipitates coma, from which their presence decreases the chance of recovery. Carbohydrate tolerance is lowered by infections of all kinds and degrees. In their presence, therefore, one must either give less food or more insulin to compensate for this depression. Empirically, we have made it a practice to instruct mothers to leave the insulin unaltered but to decrease the diet to two-thirds of its normal value. Such a measure enables them to successfully handle mild infections without any permanent decrease in the carbohydrate tolerance or the development of acidosis. Insulin must on no account be discontinued. Such a procedure, without indication of sufficient improvement in pancreatic function to warrant it, is always dangerous, but during an infection is likely to prove disastrous. If the child is too ill to take food, carbohydrate must be given parenterally. This is readily accomplished by giving 5 per cent glucose subcutaneously, followed by a hypodermic of insulin, in the proportion of one unit of insulin for each gram of glucose given. This procedure may be carried out three or four times daily until the child is able to take small amounts of fluids by mouth.

Orange juice, sweetened tea, or 5 per cent glucose may be given at this time. Diabetic patients with even mild infections should be kept in bed, in order that their metabolism may be reduced to a minimum.

When the worst happens and coma develops, what should be done? First, as pointed out before, it is urgent that treatment be started without any delay if the best results are to be secured. The actual procedure to be followed may be discussed chiefly under the indications for treatment and how such may be best met.

(1) The metabolism should be reduced to the lowest level possible, by putting the patient to bed, the careful application of external heat, and the provision of a good nurse who will spare the patient any exertion.

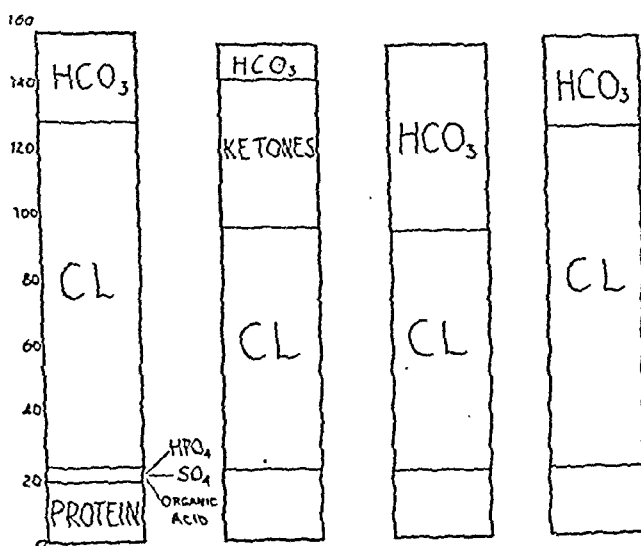
(2) Adequate fluids must be given. All comatose patients are dehydrated and need large quantities of fluid. From one and a half to four litres, depending on the age of the child, must be given in twenty-four hours. The bulk of this must be given parenterally during the first twenty-four hours, as the patient is either too unconscious to take it by mouth or unable to retain what he does swallow. Five per cent glucose in normal saline may be given subcutaneously and repeated every 4 to 6 hours, or in more urgent cases part of it may be given as 10 per cent glucose intravenously. The Murphy drip method should be used as much as possible. As recovery begins, small amounts of orange juice, or 5 per cent glucose by mouth, may be given frequently.

(3) The metabolism must be converted to a carbohydrate one. This is usually accomplished with ease in the underweight individual, but becomes increasingly more difficult for each pound of excess fat he has been allowed to accumulate. In severe cases, 10 per cent glucose is given intravenously. The injection must proceed slowly and the total amount given must not exceed 10 c.c. per pound of body weight. The pulse should be watched, and if any weakening or increased irregularity occurs the injection should be stopped at once. Immediately afterwards, normal saline should be given subcutaneously. The fluid injections must be repeated every 4 to 6 hours until the patient is able to take and retain fluids by mouth. Five per cent glucose is used. It is seldom if ever necessary to repeat the intravenous injection. In less urgent cases, all the fluid may be given subcutaneously and by rectum and the intravenous route left untouched.

When improvement permits it, small quantities of orange juice or glucose are given *per os* at frequent intervals, and the parenteral administration discontinued as soon as sufficient quantities of fluid and carbohydrate can be given in this way.

(4) Chlorides must be given in sufficient amount to make up for the depletion usually present. I mention this next to carbohydrates, because the over-zealous administration of carbohydrate and neglect of the chlorides may save a patient from an acidosis only to give him an alkalosis. It is easy to explain the need for chloride administration by the use of charts.

BLOOD ACIDS IN TERMS OF $\frac{N}{10}$



In column 1 is represented the normal acid portion of the blood. The base occupies a similar column of equal height but does not concern us much here. It will be noted that chlorides and bicarbonates, in terms of deci-normal acid, occupy the large proportion of the acid portion of the blood. Column 2 represents what happens in diabetic acidosis; the chlorides and bicarbonate are both decreased in amount and ketone bodies occupy a portion of the space which they would normally occupy. Now, when large quantities of glucose and insulin are given, the blood changes are produced such as those in column 3. It will be seen that ketones have gone, the bicarbonate has increased not only to occupy their space but that of the lowered chlorides as well, and alkalosis has been produced. If, however, sodium chloride be given with the glucose, which may be made up in normal saline, the chlorides will have been increased as the ketones decreased, and the rather labile bicarbonate will have been kept within its normal limits. One saline administration is

adequate in most cases, but when vomiting has been prolonged or is persistent more should be given. Should the timely administration of saline be neglected and the development of alkalosis be suspected from the deepening coma or prolonged respirations, 2 to 4 grams of ammonium chloride should be given by the stomach tube.

(5) Insulin is not mentioned late because of its unimportance. It is the specific in the treatment of diabetic coma, without which in most cases one would not be able to convert the metabolism to a carbohydrate one nor rid the body of its excess fatty acids. As mentioned before, it is like certain other specifics in that it suffers a marked decrease in its potency when its administration is delayed. It should be given as soon as diabetic coma is diagnosed. Should the patient be going to hospital, but if time will unavoidably be lost before reaching it, 40 to 50 units of insulin may, with great advantage, be given at once. If treating the patient either in hospital or at home, the first insulin may be given intravenously with the glucose in those cases in which the depth of the coma or the duration of the symptoms make rapid action imperative. In such cases two units of insulin may be given with each gram of glucose. In those whose condition warrants less urgent treatment, insulin in the proportion of one unit for each gram of glucose may be given by the hypodermic method whenever the subcutaneous injection of glucose is made. After the patient is able to take adequate carbohydrate and fluid by mouth, small doses of insulin (10 to 15) units may be given every 4 hours, until the patient becomes sugar free, or his condition warrants placing him on a diet, when the insulin may be injected in small doses before meals. It is not advisable to keep the patient aglycosuric until he is fully conscious, because of the danger of hypoglycæmia.

(6) The gastro-intestinal tract usually demands some attention in the successful treatment of coma. The stomach is usually dilated, sometimes to an extreme degree. If acidosis has been present any time, coffee-ground material is usually either retained in the stomach or vomited. In those cases in which the distension and the vomiting persist in spite of the general treatment of the condition, a careful lavage with soda

bicarbonate, one drachm to a pint of water, is indicated and is often distinctly beneficial. There is no real reason for employing it as a routine procedure in all cases. Constipation is usually marked and the progress toward cure is often checked by the presence of retained faecal matter. High colonic irrigations are to be preferred to cathartics. They should be repeated every 4 hours until relief is obtained. Normal saline, or the sodium bicarbonate solution mentioned above, may be used. Further care of the gastro-intestinal tract consists of the use of easily digested diets after recovery from coma.

(7) Circulatory failure is often a contributory cause of death in diabetic coma. It should be guarded against while carrying out therapeutic measures, particularly the intravenous administration of fluids, by slow injection of the latter and not giving more than 10 c.c. per pound of body weight. When these precautions are taken, the pulse is often much better afterwards. Hypodermic stimulation is usually needed in severe cases. For this purpose digitalin every 4 hours, or alternated with caffein sodium benzoate in the worst cases, so that stimulation is given every two hours, is valuable.

(8) Bicarbonates are considered by many to have had their day in the treatment of diabetic coma. It is, perhaps, well that they lie buried, and yet, in some few cases whose progress has seemed slower than anticipated, a few small doses of sodium bicarbonate by mouth have hastened recovery. They should never be given intravenously because of the danger of this procedure, and, of course, their subcutaneous administration is prohibited by their local irritating effect. In most cases none need be given; in the others, three or four, 5 grain doses, every 4 hours, are beneficial and adequate.

SUMMARY

Diabetic coma is an emergency still frequently encountered and responsible for a large proportion of the fatalities in diabetes. It is best treated by preventive measures, such as the early diagnosis and adequate treatment of all cases of diabetes, and the wise handling of its complications. Insulin provides a specific form of treatment for coma which will cure in nearly 100 per cent of cases, when it is recognized that diabetic coma is an emergency and must be treated as such.

CLINICAL CONSIDERATIONS IN THE MANAGEMENT OF THE DIABETIC*

By I. M. RABINOWITCH, M.D.,

Assistant Professor of Medicine and Lecturer in Biochemistry, McGill University.

Director, The Department of Metabolism, The Montreal General Hospital,

Montreal

IT is hardly necessary to dilate upon the possible results to be obtained in the treatment of diabetes mellitus to-day. It is now possible to subject diabetics to major operations and general anæsthesias of long duration. Diabetics, to-day, are able to resist severe infections, such as pneumonia, etc., much better than in the days prior to the use of insulin. In spite of the many conditions, both medical and surgical, which may complicate diabetes and which are frequently met with in hospital practice, the diabetic mortality rates in these institutions are low and reflect the satisfactory methods of present day treatment. In our clinic, the mortality rate approaches that of the normal population death rate. This is shown in Table I. Here are given the ratios of actual to expected deaths from diabetes before and since the advent of insulin.

It is the ratio of the actual to expected deaths which gives a clear insight into the effect of any disease upon mortality. For example, of 10,000 people living in England at the age of forty years, 97 are expected to die before their forty-

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TABLE I.
ANNUAL ACTUAL TO EXPECTED DEATH RATIOS FOR ALL AGES AMONGST PATIENTS RESIDING IN MONTREAL AND ATTENDING THE CLINIC FOR DIABETES AT THE MONTREAL GENERAL HOSPITAL.

Year	$\frac{\text{Actual}}{\text{Expected}} \times 100$
1921.....	535
1922.....	660
1923.....	280
1924.....	243
1925.....	200
1926.....	109
1927.....	107
1928.....	124

first birthday is reached. If we were to find that of 10,000 diabetics living in England at the age of forty years 194 failed to reach the forty-first birthday the death rate would be twice the normal, or expected, population death rate. That is, the ratio of actual to expected deaths is a quantitative expression of mortality.

These satisfactory mortality rates just shown are, I believe, not the result of chance, but due to the consideration of many necessary factors in the treatment of the disease. These will be presently discussed. On the other hand, in

TABLE II.
DEATHS FROM DIABETES MELLITUS PER 100,000 POPULATION BEFORE AND SINCE INSULIN.

	1921	1922	1923	1924	1925	1926	1927	1928
England and Wales:.....	10.8			10.9	11.2	11.5	12.6	13.1
London.....			9.8	9.8	9.3	10.4	10.6	
Edinburgh.....	9.3					9.5	9.0	9.0
United States:								
Total Registration Area.....	16.8	18.4	17.9	16.6	16.9	18.0	17.5	
Cities in Registration States.....	20.2	22.4	21.9	20.2	21.1	22.6	22.4	
Rural Part of Registration States..	13.6	14.9	14.3	13.4	13.1	13.9	13.3	
Registration Cities in Non-registra- tion States.....	17.0	15.1	14.9	12.3	15.3	14.7	14.1	
All Registration Cities.....	20.1	22.2	21.7	20.0	20.9	22.3	22.1	
Large Cities:								
Baltimore.....	22.1	26.0	24.2	23.1	24.9	27.2	23.6	
Boston.....	19.8	29.3	24.8	23.7	20.9	25.8	23.7	
Chicago.....	20.3	23.2	21.8	18.8	21.5	25.6	22.5	
New York.....	24.1	27.9	27.4	25.7	25.9	27.7	26.5	
Philadelphia.....	19.1	20.5	20.9	21.3	21.9	23.6	22.4	
St. Louis.....	21.1	23.4	22.0	23.0	21.8	22.5	22.6	
Canada:								
Quebec.....	7.8	8.3	7.8	9.0	8.1	10.0	11.1	
Ontario.....	11.4	12.4	13.1	10.8	10.9	12.7	13.9	13.0
Montreal.....	11.0	10.9	10.7	13.1	10.7	13.7	14.0	13.6
Toronto.....	12.6	14.5	15.6	13.1	12.8	15.6	15.1	15.1

spite of the many advantages of insulin, the present mortality rates of large populations appear to differ in no way from those found prior to the advent of insulin. This is shown in Table II. The latest available data are recorded. The various factors which may influence such data and the possibility that these stationary mortality rates of large populations may be more apparent than real were discussed in a previous paper¹. That the treatment of diabetes outside of hospitals is still far from ideal is suggested from the experiences with patients admitted to hospitals but who have been under treatment prior to their admissions.

By the above observations, I am not suggesting that hospital treatment is essential for the successful management of the diabetic. Were it so, it would be a very unfortunate state of affairs, since relatively few diabetics can come to hospitals. Since very few diabetics can receive hospital treatment, any method of treatment, ideal as it may be, if it can be carried out in hospital practice only, can hardly affect mortality rates. It is not the results, ideal as they may be, obtained with a few selected individuals, but the average obtained in the great majority of cases which influences mortality rates. Therefore, unless we alter these mortality rates, we must admit our failure to treat this disease properly. Such an admission would be a reflection on the profession, in view of present day facilities. I am, however, convinced that a good average result is possible in the treatment of diabetes by the practitioner in his office, or home, practice. How this average may be obtained forms the subject matter of this paper. Before, and for the purpose of this discussion, may I, firstly, present the following cases:—

CASE 1

A young man, twenty-five years of age, never known to have had any signs or symptoms of diabetes before, but with a family history of the disease, suddenly developed polyuria, thirst, loss of body weight and marked weakness. He had received no treatment, and five weeks later, when first seen by a physician, was in a state of severe acidosis, or in coma.

CASE 2

A man, forty-five years of age, known to be a diabetic, but whose urine had always been kept sugar-free, developed pneumonia, and, during the routine examination, large quantities of sugar were now found in the urine.

CASE 3

A woman, fifty-five years of age, with a history of having had gall bladder disease for four years, complained of being "very weak." The urine contained sugar and acetone bodies.

CASE 4

A man, sixty-two years of age, was brought into the hospital with dry gangrene of one of the lower extremities, and, during the course of examination, diabetes was discovered for the first time. A careful history revealed the fact that the diabetes preceded the gangrene.

CASE 5

On the other hand, another male, of the same age, also seen for the first time, was brought into the hospital, also with dry gangrene. There was marked generalized arteriosclerosis, and the history suggested that the glycosuria was secondary to an arteriosclerotic pancreas.

CASE 6

One other patient, known to have had diabetes for six years, but who had not been seen during the last two years, was admitted with moist gangrene and marked sepsis.

CASE 7

A child, a boy, eight years of age, with an apparently irrelevant previous history as regards diabetes, (no infection, injury, etc.) was seen for the first time. He was in coma. The mother stated that the child was apparently well until two weeks before, when she noticed that he was drinking large quantities of water. Two days before he came to the clinic he commenced to vomit.

CASE 8

Another child, two years of age, was also seen for the first time with a history of sugar having been found intermittently by the family physician during the previous four weeks. There were no other signs nor symptoms suggestive of diabetes.

CASE 9

A man, forty-two years of age, came with a history of having applied for a life assurance policy, and, during the course of examination, sugar was found in the urine. There were no other signs or symptoms to suggest diabetes.

CASE 10

A woman, thirty-six years of age, known to have had diabetes for the last four years, and who had been grossly careless both as to diet and insulin, and who was feeling and looking well until very recently, developed thirst, polyuria, weakness and loss of body weight. The urine now contained large quantities of both sugar and acetone bodies.

CASE 11

At a periodical examination, during her pregnancy, a woman, twenty-eight years of age, was found to have sugar in the urine. Renal glycosuria was excluded.

CASE 12

A man, thirty-eight years of age, known to have diabetes and in whom the disease had been under control, developed hyperthyroidism and, without any alterations of diet, glycosuria reappeared.

CASE 13

On the other hand, another man, of the same age, was seen for the first time and was found to have marked hyperthyroidism and glycosuria.

I have cited these few types of cases, though there are others, as they are fairly representative of the general population of a diabetic clinic. In each case, the treatment is different, the progress is different, and the prognosis is different. Some require insulin when first seen; in others, diet alone suffices. Of those requiring insulin, some may eventually be able to do without it, while others may not only have to continue its use, but, eventually, increase the amounts. The

prognosis, the chief concern of the patient, depends largely upon the management. Proper management depends upon proper diagnosis. Proper diagnosis depends very largely upon a careful history and physical examination, in other words, on clinical knowledge. The general clinical considerations in the management of the diabetic form the subject matter of this paper.

In the following outline I propose to bring before you the general plan of management of the diabetic in our clinic. Here and there, it will be noted, that certain practices are practically impossible outside of hospitals. These will be found, however, to be relatively few. How much of this plan can, or cannot, be followed in home, or office practice depends much upon conditions in the locality of the practising physician. Since these differ, I believe, in discussing this phase of the subject, that it would be more valuable to give an account of all that we do, rather than a few things which appear to be more practical from the point of view of office or home treatment. The plan, as outlined, certainly aims high in its demands, but the higher the aim the greater are the possible accomplishments.

Whether the patient is treated in the indoor or outdoor department of the hospital, the management is practically identical. Because of the economic factor, we avoid, as much as possible, admitting diabetics to our hospital wards, when there are no associated conditions to complicate, and unfavourably influence, the course of the disease. The routine we adopt is outlined in our Form 1,* and some of the different items will be referred to briefly.

HISTORY AND PHYSICAL EXAMINATION

The first consideration is a very careful history and physical examination. These are of the greatest assistance in determining the type of diabetic we are dealing with. Treatment and prognosis obviously depend upon the type. An acute diabetic receives insulin as soon as he is seen and, in the great majority of cases, is eventually able to do without it. A history of a gall-bladder disease with the exact date of its onset may suggest that the diabetes is secondary to a pancreatitis following some infection of the biliary passages. In such cases, other measures are taken to definitely prove, or disprove, the

presence of gall-bladder disease. Should gall-bladder disease be found, to treat such a diabetic by diet, or diet and insulin alone, and to disregard the progressive degeneration of the pancreas, is obviously poor practice.

A careful physical examination may detect some associated condition which is aggravating an otherwise mild diabetes. Failure to detect such a condition leads to misinterpretation of the severity of the disease and unnecessary exposure of the patient to low carbohydrate diets or to insulin and repeated needle punctures for long periods of time. For example, a mild diabetic with some focus of infection (teeth, tonsils, boils, etc.) may appear, when first seen, to be a severe case, since insulin is required. The treatment of such foci leads in the majority of cases to improvement of carbohydrate tolerance; some of such individuals who required insulin may now be able to do with smaller amounts or discontinue its use entirely; and those who did not require insulin may be able to tolerate diets of much more liberal carbohydrate content.

Careful physical examination may detect some condition other than diabetes which leads to hyperglycæmia. In such cases there is superimposed upon the hyperglycæmia of the diabetes that due to the other condition. Hyperthyroidism is a striking example. With proper treatment of the hyperthyroidism, that part of the hyperglycæmia which it has caused is controlled and one is now left with the hyperglycæmia due to the diabetes only. In such cases, also, as with infections, by the elimination of the complicating factor, individuals who were taking insulin may be able to reduce the dosages or discontinue its use entirely, and those who did not require insulin may eventually be able to tolerate diets of more liberal carbohydrate content. Numerous other examples could be cited in order to emphasize the importance of a careful history and physical examination.

The family history is of value, particularly with regard to cardiovascular disease. It is generally recognized that just as diabetes predisposes to cardiovascular disease, so does heredity. When a family history of cardiovascular disease is obtained particular effort should be made to control the diabetes, as such persons may be more susceptible to gangrene and other manifestations of cardiovascular disease than those without family histories of this complication.

*NOTE—The forms and pamphlet referred to in the text can be obtained from the author.

It will be noted in the above mentioned form that the patients are sent to the special clinics for examination of the teeth, ears, nose, throat, etc. This procedure is a matter of expediency because of the large number of diabetics in our clinic. Such examinations are obviously the duty of the physician in charge of the patient in general practice. This also applies to the examination of the cardiovascular system for which our patients are referred to the heart clinic.

While on the subject of physical examination, a digression about the keeping of records may not be entirely out of place. One fault commonly met with in medical records is the failure to report negative findings. These are important, particularly from the point of view of subsequent studies. Diabetes is still imperfectly understood. An important function of a large clinic is to accumulate data with regard to every possible phenomenon observed. For example, in studying the relationship between tonsillar infection and the progress of the diabetic, unless the condition of the tonsils is mentioned, one cannot, at a later date, tell whether the tonsils were, or were not, diseased or whether they were overlooked in the examination. With no record, one would have to assume that the tonsils were never examined, and this case, though it may be otherwise valuable, is lost. In order to overcome this as much as possible, a statistical history form (Form 2) is made use of in our clinic. In addition to this, a cross index system is maintained. It is, thus, possible at any time to obtain data of all our patients about any particular phase of the disease in a very short time. With a proper cross index system, the time factor in such studies ordinarily expressed in terms of many months may be reduced to days, and in many cases to hours. I mention the statistical consideration in the management of the diabetic because it applies to the practitioner, as well as to hospitals. A clinical diagnosis is a statistical conclusion. It is based upon a series of observations and the application of probabilities. The value of clinical observations made in home or office practice should differ in no way from that made in hospitals. It might here be mentioned that one of the best examples of what the general practitioner can do with regard to clinical statistics is the work of the late Sir James Mackenzie on heart disease.

As far as we have discussed the routine man-

agement it will be seen that no one procedure is as yet confined to hospital practice. We now come to the consideration of certain examinations some of which require specialized technique. On the whole, however, it will be seen that very many of these examinations are still applicable to general practice.

X-RAY EXAMINATION OF THE FEET FOR CALCIFICATION OF ARTERIES

This special examination is made particularly for the prevention of gangrene. Here, again, however, there are many clinical considerations. Particular attention should be paid to the individual who has had diabetes for a number of years, and also to elderly diabetics. Gangrene, it would appear, is not related to the severity of the diabetes but to the length of time the disease has not been under control. The readiness with which gangrene develops appears also to be related to the time of life at which the diabetes developed. In our clinic it has been noted that when the disease developed between the ages of 30 and 40 years the average time before the onset of gangrene was 9.4 years; whereas, when the disease developed after the age of 70 years, the average time before the occurrence of gangrene was less than one year.

Complaints of pain of the lower extremities require careful analysis. The complaint should not be dismissed lightly with the idea that one is dealing with a diabetic neuritis. Diabetics, it is true, are very liable to neuritis, but there is a marked similarity between the symptoms of sciatica and early gangrene. Pain extending to the toes, coming on suddenly, and at times causing limping, should arouse suspicion. Special enquiry should be made as to whether attacks of pallor or bluish-red discolouration occur in the same limb. These attacks suggest gangrene. This applies, particularly, if, on examination, the foot is found to be pale and cold and at other times congested. The diagnosis of early gangrene is probably correct if the pulse in the posterior tibial artery is obliterated and almost certain if there is no pulsation in the popliteal artery. Some patients, however, notwithstanding that they may appear to have good circulation, are susceptible to gangrene of the extremities more than others. In spite of exclusion of arteriosclerosis by careful clinical examination, in spite of the finding of good pulsation in the dorsalis pedis, posterior tibial and popliteal arteries, roentgenological examination may detect

calcification of the walls of the vessels. Proper treatment of this condition, will, in the majority of cases, prevent gangrene. It may here, however, be stated that by careful clinical examination, one can detect arteriosclerosis in the majority of cases. Having detected its presence, the procedure which is to follow is greatly clinical and applicable to general practice. A brief digression of our method of handling these cases may not be out of place.

When any sign, subjective or objective, suggestive of diabetic gangrene is discovered (coldness, fatigue of the muscles of the legs on slight exertion, absence of pulsation of any of the blood vessels, etc.) our patients are immediately referred to the Physiotherapy Department, and the following treatment is given:

During the first month the patient attends the Department three times a week. At each visit, the muscles of the legs are massaged and the patient receives ultra-violet rays (general exposure). Toe exercises are taught and the patient is instructed to repeat them three times daily. Bicycle exercises for each leg are also given. Buerger's exercises are taught and the patient is instructed to repeat these also at least three times daily, that is, before rising in the morning, at mid-day and before retiring at night.

Because of our experiences with this routine it is my opinion that of all the measures mentioned Buerger's exercises give the best results, when carried out faithfully and regularly. Since it is the most practical of all methods and can be carried out in general practice, it is described in detail here, though, it has been described repeatedly elsewhere. The following is taken verbatim from Joslin's Third Edition of the Treatment of Diabetes:—

The affected limb is elevated with the patient lying in bed, to from 60 degrees or 90 degrees above the horizontal, being allowed to rest upon a support for thirty seconds to three minutes, the period of time being the minimum amount necessary to produce blanching or ischæmia. As soon as blanching is established, the patient allows the foot to hang down over the edge of the bed for from two or five minutes, until reactionary hyperæmia or rubor sets in, the total period of time being about one minute longer than that necessary to establish a good red colour. The limb is then placed in the horizontal position for about three to five minutes, during which time an electric heating pad or hot water bag is applied, care being taken to prevent the occurrence of a burn. The placing of the limb in these three successive positions constitutes a cycle, the duration of which is usually from six to ten minutes. These cycles are repeated over a period of about one hour, some six to seven cycles constituting a seance.

The length of time of its application may, in some cases, depend upon the pain which may be induced by

elevation of the foot. In some cases the symptoms may necessitate a diminution in the period of elevation.

It cannot be too strongly stressed that failure of this form of treatment is, in the great majority of cases, the result of not carrying out the exercises with the proper care, frequency, and regularity.

In addition to the above, the following advice is given:

Cold baths should not be taken. At night, after Buerger's exercises are done, it is advisable to have a warm foot bath. The water should be sufficiently warm to make the skin of the feet and legs acquire a pink colour. During the cold weather, a hot water bottle should be applied to the feet at night. Special care must be taken not to have the bottle too hot.

This may cause blisters which may lead to gangrene. Read very carefully the "Rules for the Prevention of Gangrene" issued in the Diabetic Clinic.

X-RAY OF THE CHEST FOR TUBERCULOSIS

As is well known, diabetics appear to be more susceptible to tuberculosis than normal individuals. My impression is that this relationship should not hold as much in the future as it has in the past. The susceptibility to tuberculosis in the past, was, probably, due to the lowered resistance of the diabetic, because of his nutritional state. Diabetics, properly treated, with or without insulin, should have a normal nutrition. In spite, however, of the best efforts, a large number of patients will not rigidly adhere to their diets. This results in persistent hyperglycæmia, which is a good indication of active diabetes. Such individuals, more than others, are susceptible to all sorts of infections, including tuberculosis. As a routine, therefore, all diabetics, besides the usual physical examination, have their chests examined by x-ray every six months.

X-RAY OF THE GALL-BLADDER

About twenty-five per cent of all adult diabetics appear to have diabetes secondary to gall-bladder disease. It is now possible, in the majority of cases, to detect gall-bladder disease, in the absence of clinical signs and symptoms, and, probably, one of the best tests is visualization of the bladder wall with the aid of phenol-tetra-iodophthalein.

LABORATORY DATA

It is only after a careful history has been taken and a complete physical examination has been

made that laboratory data are sought. These consist of the following:—

Urinalysis.—The first examination is, obviously, the test for sugar. The test which should follow invariably is that for acetone bodies. It is remarkable how often one hears that the urine has been tested for sugar but acetone bodies have not been sought for. Information with regard to the latter test is most important, when, in the interpretation of the results, due consideration is given to the clinical pictures. Acetone bodies may indicate severe diabetes and suggest urgent measures; on the other hand, they may have been accidentally produced, either by starvation or by some alteration of the diet by the physician or the patient.

Examination for albumin and casts may lead to the detection of a chronic nephritis which may account for an otherwise unexplainable unsatisfactory course. Because of the chronic nephritis there has resulted a raised renal threshold for sugar. Under these conditions, the absence of sugar in the urine ceases to be an index of progress. The blood sugar examination is essential here. This examination is also, at times, important, from the point of view of the severity of the diabetes, in that albumin and casts are almost invariably found in the early stages of diabetic coma. Microscopic examination of the urine may also lead to the discovery of other lesions of the kidney, surgical, etc., which, with proper care, may be improved and this in turn may lead to a reduction of the severity of the diabetes.

Chemical Examination of the Blood.—Information with regard to the blood sugar is extremely valuable. If it is not possible to perform this test in all cases, particular effort should be made to obtain the information in certain types of patients. Occasionally one meets with a diabetic whose urine is sugar free but who actually has active diabetes as indicated by a high blood sugar, that is, the individual has a raised renal threshold. Clinically, such raised renal thresholds should be suspected in chronic nephritis, in diabetes of long duration, with histories of gross dietary indiscretions, in infections and arteriosclerosis. It may also be found in juvenile diabetics who are taking large amounts of insulin.

Cholesterol determinations demand much more elaborate technique, and such determinations, at least at present, are confined to hospital

laboratories. For the value of this test I may refer to a recently published article².

COMA

In a discussion of the clinical aspects of diabetes, one cannot close without a brief reference to coma. In the diagnosis, and in the management, of this serious complication, the clinical consideration of the patient is, by far, the most important, compared with laboratory tests. The degree of coma, whether the individual is merely drowsy or semi-conscious, is a valuable guide for the dosage and mode of administration (subcutaneous or intravenous) of insulin. The colour of the skin gives some idea of the condition. The bright red healthy colour of the skin, its warmth and dryness in the early stages, stand out in striking contrast to the cold, moist and cyanotic skin in the last stages when heart failure is beginning to play its part and when cardiac and respiratory stimulants are indicated. With regard to these stimulants information concerning the pulse and blood pressure is, obviously, also of value. The respirations in uncomplicated coma, are, as is well known, characteristic. The condition of the eyes, particularly the tension of the eyeballs, is of much diagnostic significance. So far as the writer is aware, there is no other form of coma associated with a soft eyeball. The condition of the tongue with its dryness, beef-like colour and the sand-paper-like sensation it yields on palpation, is characteristic and the diagnostic value of the acetone odour to the breath need hardly be emphasized. With a knowledge of all these clinical phenomena, the blood and urinary findings are of secondary importance. In order not to miss any of the above clinical details, we have, in our clinic, a routine diabetic coma sheet, upon which, during the course of the coma, the house physician may make hourly clinical notes.

My remarks may have appeared to be rather general and fragmentary. They are confined to general considerations rather than to the diagnosis and detailed treatment of any particular type of diabetic, of which the literature is full. My purpose is to emphasize the important part that careful examination of the patient plays in the management of diabetes. The urine of practically any diabetic can be made sugar-free, either by diet alone, or by diet with insulin, in a very short time. The important thing is to keep it free. Success and the patient's future, however, depend very much upon the treat-

ment of the various conditions referred to. The treatment of these conditions obviously depends upon the recognition of them, and this, in turn, depends upon a careful history and physical

examination and not only upon *simple* urinalysis or estimation of blood sugar.

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FUNDUS MANIFESTATIONS IN METABOLIC DISEASES*

BY WALTER R. CAMPBELL, M.A., M.D.

Toronto

THE changes occurring in the fundus oculi have a distinct value in the diagnosis and prognosis of certain diseases. To the neurologist fundus examination is of course invaluable, but to those working in the field of general medicine the ability to recognize five-fundi is of particular importance. The first, of course, is the normal fundus; the second, the arteriosclerotic fundus; the third, the diabetic fundus; the fourth, the nephritic fundus; and, last, the fundus of malignant hypertension. Naturally, it is desirable to be able to differentiate these pictures one from another and also from other diseases of the eye. Of greatest importance, however, is the ability to recognize that the fundus is abnormal or unusual, thereby recognizing the necessity for calling on a trained ophthalmologist for assistance. Important as it is, I do not intend to describe the normal fundus but merely to notice some of the abnormalities as they occur in these cases. Among these I have placed the arteriosclerotic fundus first, since it is the simplest and is also encountered in its various forms in other conditions.

Many of us are apt to be discouraged with our slow progress in ophthalmoscopy. With modern instruments the difficulty is not so much due to technique as to the supposed dearth of suitable patients. In point of fact there is no dearth. The more fundi of normal individuals one can examine the better is one prepared to recognize the abnormal fundus. As to the abnormal, they are not less frequent here than elsewhere in the world and diligent search for them brings its reward. A careful and complete examination of the retina can scarcely be made without dilatation of the pupil with a mydriatic. Particularly in the aged with short anterior chambers, the danger of subsequent glaucoma should be avoided by in-

stilling a drop of one-half per cent eserine solution in the conjunctival sac after examination.

Text-books usually describe first the optic disc. In this group of cases the disc or papilla is of lesser importance than some other structures in the fundus, such as the vessels. By direct ophthalmoscopy the fundus is magnified some fifteen times, and by moving slightly, if necessary, a vessel comes into view. These vessels are similarly magnified so that we have here an opportunity of observing comparatively small vessels, vessels much smaller than any we can palpate, and at the same time much nearer to the actual distributors of nutrition to the body cells, the capillary vessels. As Moore has pointed out, these vessels are not normally subject to the high pressures or to the large variations in pressure that obtain in other larger vessels. The blood flow is more continuous than rhythmic, and pulsation is noted only under exceptional circumstances. The retinal vessels are located in the inner, cerebral, or nerve fibre layer of the retina. Veins are about one and one-half times the diameter of the accompanying arteries, appear somewhat less cylindrical than arteries, are darker in colour and rarely possess as marked a light streak unless abnormal. In the albinotic or in the tessellated fundus indications of choroidal blood vessels are seen in the form of red flat ribbons extending apparently without pattern across the field. It is impossible to differentiate the choroidal artery from the choroidal vein.

Tracing the retinal vessels toward the disc there may be several features worthy of note in arteriosclerosis. It is sometimes thought that tortuosity is one of the most important of these, but, as a matter of fact, the large individual variations in tortuosity of normal vessels make the diagnosis somewhat difficult. When, in an oedematous retina, the vessels are seen to weave into and out of focus by assuming different

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depths in the inner retinal layer as well as a distinctly tortuous course over the fundus, and also when the macular arteries are seen to pursue a course resembling a corkscrew, tortuosity may be diagnosed by the least experienced, but much experience is necessary to identify the less pronounced cases of tortuosity.

The size of the vessels is of considerable importance in differentiating various fundus conditions. In simple arteriosclerosis the size of the veins is not changed from normal, nor is the size of the artery consistently changed. In speaking of the size of the vessel, however, it must be remembered that the normal vessel is perfectly transparent and therefore invisible. What we really see is the size of the blood column. When, however, a thickening of the intima occurs it is usually somewhat patchy in character and this is shown by a contraction of the blood column alternating with regions where its width is normal. This is characteristic of an *intimal* sclerosis of considerable severity. The light streak on the artery is normally about one-fourth the width of the artery. With the development of a *medial* sclerosis this becomes wider and assumes a burnished copper appearance and sometimes appears to be finely beaded. Considerable care must be exercised in the interpretation of this sign, as it is only an exaggeration of the normal and is somewhat dependent on the amount and quality of the light used, but, when well marked, it may be regarded as definitely pathological. In essential hypertension it is only seen in the severe or late stage of the disease. Distinct perivasculitis is seldom seen in the simple arteriosclerotic fundus.

Some of the most important signs of vascular sclerosis are to be found where arteries and veins cross. Often the vein is faintly visible through the normal artery wall, and it is, of course, visible right up to the artery wall. In arteriosclerosis the vein becomes invisible for some little distance from the arterial blood column due to the increase in the thickness of the artery wall. Accompanying the more severe degrees of arterial change there is also a distinct change in direction of the vein as it is crossed by the artery. While the usual course of the vessels may make acute angles at the crossing, one sometimes sees the vein turn sharply to pass under (or over) the artery at a right angle, then turn back to continue the original direction.

Tracing down the vessels one comes upon the papilla. Careful examination of the papilla

should be made for colour, the condition of its margin, the level, and the vessels. In simple arteriosclerosis, apart from the changes which may occur in the vessels, there is slight if any abnormality of the papilla. Four principal arteries with the accompanying veins pass out from the papilla and each of these should be examined in turn for the foregoing evidences of vascular sclerosis. In addition, the sector of the retina through which the vessel courses should be searched for other abnormal findings, such as oedema or white areas, and particularly the macular region should be examined for a macular star—partial or complete. These appearances should not be present in the simple arteriosclerotic fundus, nor are hæmorrhages, though frequently present, a necessary feature of this condition. They seem more likely to be present if high blood pressure accompanies the arteriosclerosis and are commonly superficial and flame shaped, though round punctate hæmorrhages in the deeper layers of the retina also occur. Chorioretinitis is sometimes seen in simple arteriosclerosis, though it also accompanies syphilis, tuberculosis and nephritis. Pigmentation and depigmentation, alone or intermingled with white areas representing complete sclerosis of the vessels of the choroid, or white areas with red ribbons representing their partial sclerosis, are to be found in the fundus deep to the retinal vessels. In arteriosclerosis the macular and the peripapillary area are most frequently affected, but the degree of injury is seldom as great as with syphilis or even nephritis.

I have described, at some length, the characteristic features of the simple arteriosclerotic fundus. These features are found in varying degree in the fundi to be later described, or in other words the peculiarities of these fundi are usually engrafted on a basis of arteriosclerosis or raised blood pressure, or both. Diabetics frequently have ocular abnormalities, many of them more interesting than the fundus changes, but these cannot be discussed here. The fundus changes of diabetics never occur in the young and have no relation to severity, and the diabetes is of some considerable duration when they become recognizable. It is equally true, however, that diabetes of long standing may be present without any alterations in the fundus other than those of simple arteriosclerosis.

While the diabetic fundus has some points of resemblance to that of other conditions certain points are rather distinctive. Fine, rounded, yellowish-white solid masses with sharp edges,

sometimes confluent, may occur between papilla and macula and surrounding the macula. Hæmorrhage and hypertension are absent. The disc is normal. There is never a macular star. In cases of greater severity hæmorrhages of varying size appear, and in the most severe cases a retinal exudate and papilloedema are present, which is difficult to differentiate from those of renal injury, since raised blood pressure and albuminuria are also present at this stage. The earlier degrees are susceptible to dietetic and insulin treatment. The more severe degrees are not, though I am not prepared to agree with Grafe that they constitute a contra-indication to insulin treatment of a diabetic patient.

The picture in diabetic lipæmia is an unusual and exceedingly characteristic one. The eye-ground as a whole is pale as in an anæmia, but the blood vessels are unique. The artery and vein are the same colour and this colour is creamy white at the vessel margins, particularly in the periphery of the fundus, with an increasing amount of red tint toward the midline of the vessel. As the fat appears to collect along the vessel wall and even to infiltrate it, one continues to find the sign present when drawn blood no longer shows evidence of lipæmia macroscopically. Approximately six per cent of fat must be present in blood before the lipæmic fundus is recognizable as such. No changes appear in the disc. The condition occurs only in the young and only during diabetic acidosis or coma. The administration of insulin rapidly abolishes all evidence of lipæmia and the lipæmic fundus soon returns to normal. The sweet odour of acetone, or other signs of acidosis, invariably accompany the lipæmic fundus and there is little if any danger of confusion with the retinitis of leukæmia, which differs also in showing papillary and peripapillary œdema, hæmorrhages, and often broad white lines alongside the vessels.

It has been previously indicated that the fundus lesions of renal disease are associated with evidences of arteriosclerosis. While this is in the main true certain qualifications should be noted. In degenerative kidney lesions or nephroses no fundus changes are found. The focal nephritides, such as may be encountered in subacute bacterial endocarditis, puerperal infections, etc., sometimes show a few white areas of degeneration and hæmorrhages, usually with a white centre. In not more than ten per cent of cases of acute diffuse glomerulonephritis a papilloedema and retinitis, with cotton wool exudates and hæmor-

rhages, may occur in the retina. These heal completely. Chorioretinitis and the macular star are absent. In the subchronic stage of nephritis (parenchymatous nephritis) seldom are eyeground changes seen unless the blood pressure is unusually high. Hæmorrhages, a retinal œdema, and rarely a papilloedema may occur.

The fundus changes in the nephritis of pregnancy may be particularly severe and often permanent. They are similar to the changes seen in acute glomerulonephritis but, as a rule, more extensive. The arteries are often contracted and a neuritic atrophy may follow. The grade of œdema may be so great as to produce a detachment of the retina, and chorioretinitis with pigmentation may occur. The prognosis in retinal detachment in these cases as opposed to that occurring in rare cases of acute glomerulonephritis is not wholly bad. Re-attachment is sometimes seen, but if this does not occur soon further degenerative changes are inevitable and vision may be much reduced, especially if the macular area is involved. Therapeutic abortion or induction of premature labour must be carefully considered. Since the retinitis usually occurs in the later months of pregnancy a viable child is to be expected. If early fundus changes only are present these may be favourably influenced by such procedures, but late changes are not. Other eye diseases, especially the fundus changes of a chronic nephritis, are unfavourably influenced by pregnancy, and therapeutic abortion is indicated not only from the ocular but also from the renal standpoint. As to the likelihood of recurrency of retinitis in subsequent pregnancies opinion is divided. It now seems probable from recent evidence that the renal injury will recur in perhaps seven out of ten cases and in some of these fundus changes may be expected to develop. Such patients should be advised against pregnancy.

In chronic glomerulonephritis the development of retinal changes is of evil omen, indicating as it usually does death within one to two years. Many have thought that the retinal vascular sclerosis in chronic nephritis is secondary to the retinitis. This is, however, wholly contrary to the history of renal disease, and from a pathological standpoint must be regarded as improbable. There can be little doubt, however, that the advance is rapid following the development of a retinitis. Due to the associated anæmia, the disc, as well as the fundus generally, is pale. Papilloedema is rare; cotton wool exudates are

rare; but dense white snow banks may surround the disc and appear elsewhere in the fundus. Absorption of these takes place leaving fine white dots in the retina which, in the macular region tend to arrange themselves in a star-shaped or fan-like manner. Flame-shaped hæmorrhages occur in the nerve fibre layer, and exudate and hæmorrhages in the deeper layers of the retina, and later varying degrees of chorioretinitis with exudates, pigmentation and depigmentation appear. With such changes in the fundus an advanced degree of renal insufficiency is present. Indeed, it would appear that renal insufficiency is an essential feature in the development of this picture, since it also appears in the late stages of the subacute progressive form where vascular changes are not so marked but renal insufficiency is an outstanding feature of the patient's condition.

Closely allied to the fundus changes of chronic nephritis are those described by Keith and Wagener in malignant hypertension, or by Foster Moore as arteriosclerotic retinitis, and from the renal viewpoint by Volhard and Fahr in the so-called 'combination form' of arteriosclerosis plus nephritis. Keith's work, however, goes to show that the injury is more widespread than a vasculo-renal disease and that such patients may suffer more from the cerebral and cardiac complications than the renal element. Proof that a patient with a typical fundus has a satisfactory renal function is not to be taken as indicating a good prognosis as such patients usually die in a relatively short time of other causes—cerebral or cardiac failure—or, more typically, of a simultaneous failure of all three. In the fundi the arteries are strongly contracted; arteriosclerosis is always a prominent feature; the retinitis consists at first of a papillary hyperæmia and mild œdema with a few peripapillary cotton wool exudates and hæmorrhages. Intimal sclerosis is rare. With greater severity the area of the serous peripapillary œdema extends outwards involving the macula. Exudates are still of the cotton wool variety. Later, the hyperæmia of the disc fades, the œdematous area recedes from the periphery,

punctate exudates appear, and a fine macular star develops. Vascular sclerosis becomes more marked; perivascularitis appears, denoted by the silver wire artery and the white lines beside the blood column of both artery and vein. In the last stage secondary optic atrophy, macular star, punctate exudates, a few hæmorrhages, and marked retinal arteriosclerosis and chorioretinitis are present. Vision is, of course, reduced. This final stage is seldom observed, as the patients usually die in the preceding stages. This picture differs from that of chronic nephritis in the contraction of the arteries, the degree of sclerosis, the well-marked hyperæmia of the disc and the papilloœdema, and the absence of the peripapillary snowbanks of nephritis, together with the clinical evidence obtained from the history and physical examination of the patient.

Few other metabolic diseases show characteristic fundus changes. In hyperthyroidism pulsation of the retinal arteries at a distance from the papilla occurs. Aortic regurgitation, intracranial or intraocular tumour, and glaucoma must be excluded. As the sign is not constant and is only present in well-marked cases of the disease it is seldom used. Coupled with an arterial flash seen extending to the finger-tips on their transillumination, it is, in the absence of aortic regurgitation, as highly diagnostic as the estimation of the basal metabolic rate, though it cannot be used in a quantitative manner.

A question may be asked: Are these fundus changes diagnostic? Can one by this means recognize the disease causing the injury? The answer is: sometimes; with increasing skill, more often. It should be pointed out, however, that we seldom make a diagnosis on a single observation, and the recognition of these abnormalities in the fundus should initiate an investigation calculated to uncover their cause. When this is discovered the state of the fundus gives useful information and no mean help in many instances as to the probable outcome of the case, not alone from the standpoint of the ophthalmologist but also from that of the internist.

METALLIC INTRA-OCULAR FOREIGN BODIES NOT DEMONSTRABLE ON ROENTGENOGRAMS.—In one of two cases reported on by N. M. Black and F. Herbert Haessler, Milwaukee, in which an intra-ocular foreign body of iron was not demonstrable on an entirely satisfactory roentgenogram, the foreign body remained in the iris for a year. The mass of tissue that formed about it was diagnosed as a neoplasm since the Wasser-

mann and tuberculin reactions were negative and because they assumed that foreign body had been reliably ruled out by the roentgen examination. A fragment of iron longer than 1 mm. was found in the piece of iris tissue removed, and subsequently a wound of entrance through the cornea was demonstrable.—*J. Am. M. Ass.* 93: Oct. 5, 1929.

at least making an effort toward its control.

We usually give tryparsamide immediately on terminating malaria, and continue with 3 grams a week for 12 to 15 weeks. To this weekly dose of tryparsamide we also add one grain of bismuth, but never salvarsan or mercury.

This leads me to make some reference to the use of salvarsan and mercury in general paresis. The records of our hospital bring out one fact strongly, *viz.*, that a considerable percentage of our very worst cases have a history of intensive treatment with these drugs. It is outside the scope of this paper to enter the present controversy as to the value of these drugs. We simply say that once the nervous system has been invaded by syphilis, this hospital does not use either of these drugs as a treatment, much less a cure.

We have used typhoid vaccine instead of malaria in three cases. We found the chills were very much harder on the patient, undoubtedly more exhausting, and the results so far as the reduction of the serological findings were concerned were not as good; moreover, no patient appeared to be improved mentally by them.

In making a prognosis, both the age and type of patient must be taken into account. In none of our cases under 35 years of age have we secured much success with either malaria or tryparsamide. In most, the treatment seemed of little avail, and the disease progressed to its inevitable fatal termination. It is worthy of note that the period of incubation in all these cases was very much shorter than the average 15 years, but again discussion on this point would take us beyond the bounds of this paper, and would lead into vague speculation on the true nature of the paretic process. Men advanced in years, we find, are poor risks, while patients of the confused, demented, or paranoid hallucinated types, may have an apparent arrest of the disease, but with no restoration of the mentality.

As regards sex, the number of women patients has been small, but the percentage of satisfactory remissions has been more than equal to that of men, in spite of some reports now appearing tending to show that women respond less favourably than men.

A person about the age of 40 to 50 years, previously untreated, exhibiting the so-called classic picture of "G.P.I." that is, delusions of grandeur, slurring speech, etc., will almost in-

variably, if taken early before his physical and mental condition becomes deteriorated, show dramatic improvement from malaria therapy.

After all, *early treatment*, before this dread disease has wrought damage to both mind and body, is the great object to be aimed at. It was the realization of this fact which led us in 1927 to apply malaria therapy to a few patients before they had time to develop mental symptoms. It might be claimed that some of these cases would never develop insanity. Our reply is, "Who knows?" Short of the typical post-luetic tabetic, who, it is said, very seldom becomes demented, he would be a very rash physician who would say to a patient suffering from an early attack of cerebro-spinal lues, "You will never become insane". But granted for a moment that mental trouble does not develop, there are other sequelæ of neurological syphilis which are almost as much to be dreaded as general paresis. The number of cases of this type which we have had the opportunity to treat is necessarily limited, as neither the family physician nor the patient feels like invoking the assistance of an "asylum" or its doctors before mental symptoms render it absolutely necessary. We have, therefore, a series of only 18 cases to present. These 18 all showed various types of neuro-syphilis, ranging from frankly paretic forms through the cerebro-spinal and meningitic down to the typical post-luetic tabetic. While we humbly confess our inability to distinguish always between these forms (and not so humbly declare that we think no one else can) we are positive that every one of the 18 suffered from some form of neuro-syphilis. Besides ourselves, every case was seen by one, and most of them by two competent physicians; in every one the diagnosis from the serological and clinical signs was unanimous. Nearly all these patients have been treated one to two years ago. Out of the 18, two are dead; malaria, it is true, hastened their death. It is as undoubtedly true that both would have become insane and died, as both were showing mental symptoms and both were in poor physical condition. One was killed in a street car accident after recovering from his malaria; this was entirely accidental and not dependent in any degree on his physical or mental state.

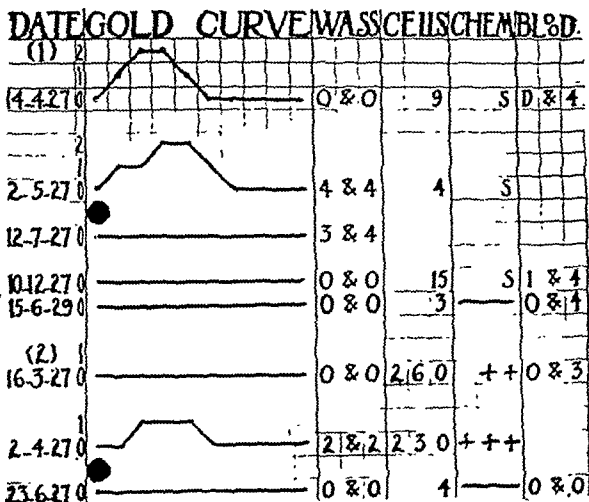
Charts of the serological condition of the remaining 15 are presented. It will be noted that all the records, are, unfortunately, not complete

in their serological details, but we, or their family physicians, have seen all the patients recently. In nearly every case in which they are complete, however, it is striking to see how the serological findings in these comparatively early cases have improved.

Two points must here be noted. These cases comprising all types of neuro-syphilis, which, compared to the average patients admitted to an asylum must be regarded as in an early stage, but from the standpoint of a genito-urinary or neurological clinic would be considered as well developed and in many cases hopeless material, have shown as a group far more marked improvement than is ever obtained in the case of patients who had progressed to a stage which rendered their commitment to an asylum inevitable. Therefore it would appear probable that had these patients been treated with malaria when the involvement of the nervous system first became evident, instead of this treatment being delayed till very marked disability occurred, the patients would have been saved much expense, loss of time, and suffering, and their present average condition as a group would have been better than it is now.

The second point is this; the serological improvement is after all of minor importance. The physical condition of the patients is the chief consideration and in all of these, it can be emphatically stated that the clinical improvement is if anything more marked than the serological. The one clinical feature which presents some exceptions to this statement is the existence of severe tabetic pains in their various forms; these are very obstinate and hard to relieve. However, I am stating the facts conservatively when I say that the pains have been relieved in all cases, and in the majority greatly relieved. As far as the other symptoms were concerned we must remember that we have here a group of 15 men and women, most of them with a history of intensive salvarsan and mercury treatment. They were all incapacitated from carrying on active life and were facing a very dark future. To-day they are performing their daily tasks and justifiably meet the problems of life with much more confidence.

In the charts the black dot immediately to the right of the date column indicates where intervention by malaria took place. Owing to lack of space only cases Nos. 1, 2, 3, 4, 5, 6, 7 and 8 are shown.



CHARTS OF CASES 1 AND 2

CASE 1

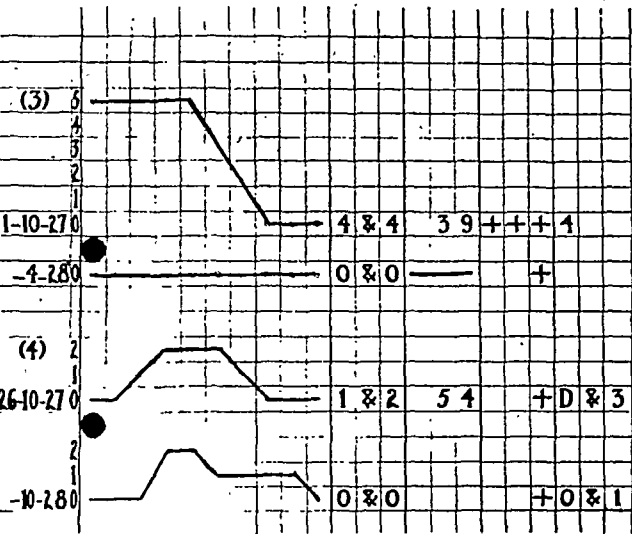
A woman, aged 39 years. This patient might be expected to show the least satisfactory results for she suffered from a typical post luetic intense girdle sensation, very severe crises, marked Rombergism, and Argyll-Robertson pupils. She had a marked tabetic gait, "wool" sensation in the soles of her feet, marked bladder and rectal symptoms, but no mental symptoms. She had had intensive treatment with salvarsan and mercury for one year and was referred to us by her family physician as he was afraid of his patient becoming helpless. (The second serological examination shows the effect of a provocative dose of tryparsamide). We were rather reluctant to give malaria in this case as the outlook did not appear very promising. The patient however was insistent and malaria was given during May and June, 1927. The result was a marked diminution of her crises. She has been able to do her own housework and assist her husband in his business. When last seen she said her pains were getting fewer and less severe.

CASE 2

A male, aged 53 years, clerk, with a history of ten years' anti-luetic treatment; one year's incontinence of urine and faeces. He could not wash his face for the last year unless propped up in a corner. When seen, the patient was in bed complaining of intense supraorbital pain. The legs were markedly spastic, with bilateral Babinsky sign, marked clonus, and absent abdominal reflexes; increased knee reflexes. The pupils were equal and reactive. No mental symptoms. Malaria was given during April and May, 1927. Both the serological and the clinical improvement was striking. The supraorbital pain, incontinence, increased knee jerks and Babinsky sign have all disappeared. The patient has felt well, has worked hard as a freight clerk, and has gained weight ever since.

CASE 3

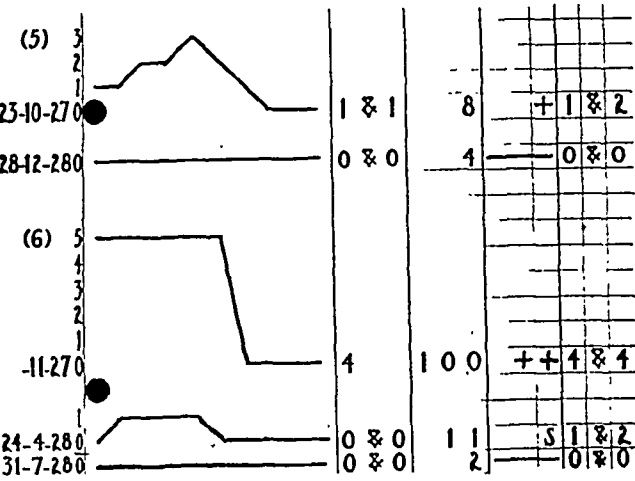
Male, aged 48 years, farmer. A history of anti-luetic treatment for some twenty-years, also marked loss of weight and strength for the last year. The patient was seen in the local hospital. He had intense supraorbital pain, absent abdominal reflexes, and lessened knee jerks. Other reflexes were normal. Malaria was given in October, 1927. He has gained in weight and strength, and works on his farm. His physician considers him to be doing very well.



CHARTS OF CASES 3 AND 4

CASE 4

Male, aged 60 years. A history of 30 years anti-luetic treatment, including the Swift-Ellis methods. Marked loss in weight, aortitis, marked unsteadiness on feet, intense crises; a history of fainting spells. In spite of his age and poor condition the patient insisted that he be given malaria, which was done in November, 1927. He withstood it well. The crises have disappeared, but he occasionally feels some lightning pains in his right heel. He has gained in weight and strength and has ever since followed his previous occupation. We must remember however that this man's vascular system is deeply involved and this, combined with his age, may lead to serious results. We feel confident however that he will not die of neuro-syphilis.



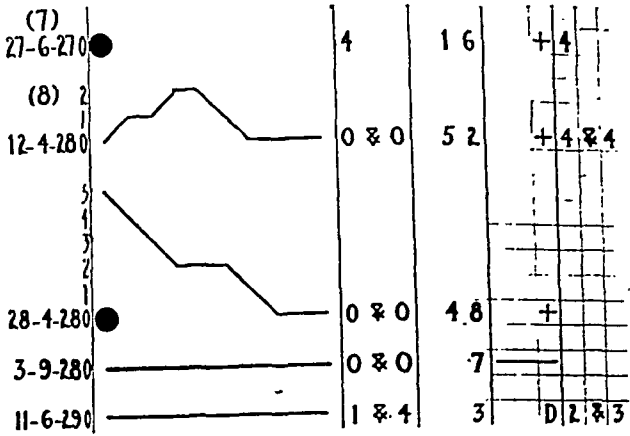
CHARTS OF CASES 5 AND 6

CASE 5

A college professor, aged 45 years. A history of four years anti-luetic treatment. The physical signs were fairly well marked. Mentally he was nervous, agitated, so much so that he found it impossible to carry on his work. He was given malaria on October 31, 1927. The serological results are shown. Last seen in January, 1929. He had been lecturing for a year, had gained in weight and strength and was free from his dread disease.

CASE 6

A woman, aged 45 years, housewife. Somewhat slow and enfeebled mentally; fair insight. The physical signs were fairly well marked; marked loss of weight and strength. She received malaria on November 23, 1927. When last seen, on June 15, 1929, she was in good physical condition, was cheerful and mentally clear, and was doing her own housework.



CHARTS OF CASES 7 AND 8

CASE 7

Woman, aged 42 years; housewife. Mentally unstable. Unfortunately, she happened to be badly hurt when the first serological examination was made and she has steadfastly refused to have another lumbar puncture. The physical signs were very strongly marked, indeed so much so, that she was confined to bed. There was great vesical disturbance, and as the patient expressed it she was "dead from the waist down." Mentally she was somewhat unstable. Malaria was given on October 24, 1927. She has ever since refused to allow a puncture, but her two physicians both report that she has gained in weight and strength, has done her own housework ever since, and, as they express it, for all practical purposes she is cured.

CASE 8

Male, aged 38 years, forester, referred to us from a local hospital with a diagnosis of tabes. The physical signs were very marked; intense gastric crises; vesical disturbance; fifty pounds loss in weight in last year. His general physical condition was very poor, and he was confined to bed. No mental symptoms. For three weeks we debated whether he would be able to withstand fever-therapy, but at his insistence we finally treated him. He was discharged June 4, 1928, improved, and went back to work. We saw him in September, as the serological examination shows. In June, 1929, he visited us again, and reported having worked all winter in the bush under very rigorous conditions. He had gained 40 pounds in weight. The crises were completely absent. The vesical disturbance was gone, but his gait was still tabetic and knee jerks decreased. From the patient's point of view he feels that he is well.

CASE 9

Female, aged 42 years, housewife. The physical signs here were fairly well marked, and patient was listless and depressed, and unable to work. She received malaria in February and March, and was discharged improved in April, 1927. The serological reports for June is shown, by which time the patient seemed normal and did her own housework. We have

not heard from her since the end of 1928 when she was reported to be well and doing her housework as usual.

CASE 10

A woman, a housewife, was seen in consultation with the family physician. The physical signs were marked; mental lethargy; poor physical condition. She was given malaria in August, 1928. She is at present reported by her physician as well and doing her own work.

CASE 11

A male, aged 48 years, seen by the local neurologist in September, 1928. He presented squint, double vision, left ptosis, double Babinsky sign, Argyll-Robertson pupils, recent weakness of limbs, and one year's history of delay in micturition and impotency; no mental symptoms whatever. He received malaria in October. The result on the serological findings is shown, and his physician reports "great improvement, vision normal, no weakness of any kind, working steadily at business."

CASE 12

A male, aged 50 years, had received a long course of tryparsamide and mercury in local clinic. In May, 1928, he presented marked optic atrophy, with distinct impairment of vision, loss of weight, and the ordinary physical signs of cerebro-spinal syphilis were marked. He was unable to work, and there were already slight mental signs. Malaria was given in May and June. The results of two punctures, one taken immediately after, and the other one year after, are shown. The patient has improved physically and mentally. The field of vision is increased, the optic atrophy is at least no worse, and he has worked steadily for the past year.

CASE 13

A male, aged 38 years, was seen during July, 1927. He gave a history of long treatment with salvarsan and mercury. Distinct optic atrophy was present, also girdle sensation, lightning pains, and bladder symptoms. There were no patellar reflexes; Romberg's sign was present and considerable ataxia. The pupils reacted poorly to light. The patient was utterly unable to work. No mental signs. He was given malaria in July, 1927, and was discharged improved. He disappeared from our observation for two years, but the result of a puncture done July 10, 1928, is shown. At that time he had no lightning pains, less girdle sensation, less ataxia, improved bladder function, and had been working for some time.

CASE 14

A male, aged 40 years. His serological condition on June 29, 1927, is shown. At that time he was depressed, irritable, tremulous, his speech was slurring, the legs, spastic; a right Oppenheim sign was present, and he had Argyll-Robertson pupils. He was utterly unable to work. He was given malaria in June and July, 1927, and, like Case 13, he disappeared from view until March 7, 1929, at which time he was able to work and his general symptoms were much improved.

CASE 15

A male, who presented himself to a local neurologist in October, 1928, showing loss of knee jerks, Argyll-Robertson pupils; speech and ideation were sluggish, and mentally there was a suggestion of general paresis. His physical condition was poor. He was given malaria immediately, and in February was reported on by his physician as already showing marked improvement in speech, ideation, and physical

condition. The serological aspects were still unimproved.

Before concluding this paper let me put before you a few personal thoughts as to why non-specific therapy succeeds when specific treatment has so signally failed. We doctors are prone to forget the fact that almost never do we cure a disease with drugs; at the most, we relieve symptoms. The *vis medicatrix naturæ* is what we depend on to cure disease. We give rest, we arrange diet, we combat symptoms merely to give time to allow this force to accomplish the cure. Wagner-Jauregg recognized this fact as early as 1888-1889, when he undertook the first researches in non-specific therapy for syphilis, ranging from erysipelas, tuberculosis, typhoid, sodium nucleinate, and, finally, in 1917, to malaria.

One may say that tryparsamide is a specific drug, but we must remember that even with a full dose the arsenical content of tryparsamide is very small; also that arsenic in small doses is still recognized as one of our best tonic drugs. We have found good nursing, nourishing food, fresh air and sunlight just as valuable in treating cerebro-spinal lues as they are in any other chronic infection. At any rate, whatever may be the underlying factors which induced the beneficial effect, it is certain that the course of our patients during recovery was not such as to lead us to believe that the improvement was due in any large degree to specific action. In both our tryparsamide and our combined malaria and tryparsamide series the relief of symptoms which took place was subsequent to the physical betterment of the patients. They first began to gain strength, to increase in weight, and to show a more normal appetite. In watching their recovery one was strongly reminded of the way in which the body recovers from any wasting disease. The whole picture during convalescence seemed to be due to a marshalling of the resistive forces of the body rather than to a direct spirochæticidal action of drug treatment or therapy with the malarial organism.

SUMMARY

1. Before the introduction of tryparsamide in 1923 practically all patients admitted to this hospital suffering from cerebro-spinal lues progressed to a fatal termination.
2. Of 41 patients treated with tryparsamide

and mercury from May 1923, to May 1925, 9 are still going on satisfactorily outside.

3. Of 40 patients treated by means of malaria followed by tryparsamide and bismuth, 16 are still carrying on outside.

4. Malaria followed by tryparsamide is a much more adequate treatment than tryparsamide alone, for three reasons: (a) It is much quicker, and in some cases at least it forestalls hopeless degeneration; (b) the danger of optic atrophy is much less; (c) a much higher percentage of patients secured satisfactory remissions under malaria than under tryparsamide alone.

5. The use of tryparsamide alone, to the exclusion of malaria, is to be deplored, but it has distinct value when used subsequently to fever therapy. It may possibly be of value when the patient's physical condition is clearly such that malarial inoculation would be fatal.

6. Induced malaria is easy to stop, and is not infective.

7. In our series the improvement among women was if anything better than that among men.

8. In view of the poor results of other forms of treatments we feel that we cannot lightly undertake the responsibility of refusing to inoculate a patient with malaria, even on the grounds of a poor physical condition.

9. We have treated a small series of cases before pronounced mental symptoms set in. Our results in this group have been much more strik-

ing than those obtained among our asylum population. These results have been indeed so marked that we feel that no patient suffering from any form of neuro-syphilis should be allowed to progress to an asylum before malaria is tried. The success in typical cases of post-luetic tabes is not so gratifying as it is in the other types, but it is greater, especially in relieving pain, than any other forms of treatment we are aware of.

10. We feel that non-specific therapy succeeds not so much because of a direct spirochæticidal action but because it enlists and stimulates the natural resistive forces of the patient, in other words, the same means whereby any infection is overcome. The value of good nursing, good food, fresh air, and sunlight must not be lost sight of in this connection.

From the clinic at the Verdun Protestant Hospital.

The writer gratefully acknowledges the advice and direction of the medical superintendent, Dr. C. A. Porteous, and of Dr. Norman Viner, acting neurologist. Dr. Viner has manifested a close and sympathetic interest in this work since its inception in 1923. The writer has also to thank him for permission to use some of the case reports presented. His thanks are due as well to Miss A. M. Fish, serologist, Montreal, for her careful, and, in many cases, unrewarded, work, done in testing the blood and spinal fluids of our patients.

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2. PORTEOUS, C. A., AND MENZIES, E. C., *Canad. M. Ass. J.* 17: 536-542, May 1927.

EYE EXAMINATION OF SCHOOL CHILDREN.—Frank H. Robin discusses methods of examination of the eyes of school children: He says that there is a marked discrepancy in the percentages of defective vision found in the examination of school children by various observers. There is no definite standard of what to consider defective vision in children examined in the schools. The examination of the eyes is often done under unfavourable surroundings and by unqualified persons. The nurse's room should be so arranged that vision can be taken under uniform conditions. The following standard is recommended: Children attending kindergarten and the first five grades, while standing on the 15 foot line, should be able to read the 20 foot line on the chart with the better eye, and the 30 foot line, or better, with the other eye. Vision below that is to be considered defective. For children of the upper grades this standard is suggested: While standing at the 18 foot line they should be able to

read the 20 foot line on the chart with the better eye, and the 30 foot line, or better, with the second eye. In testing the vision of 15,267 children in San Francisco, Rodin found that 12 per cent had eye defects. Children with marked defective vision should be referred to the special sight-saving classes. The eye examination should be done by the medical school inspector along with the routine physical inspection. The importance of the routine eye examination in the schools cannot be overemphasized.—*J. Am. M. Ass.* 93: 911, Sept. 21, 1929.

“Experimental science has three great prerogatives over other sciences; it verifies conclusions by direct experiment; it discovers truth which they never otherwise would reach; it investigates the course of nature and opens to us a knowledge of the past and of the future.”—*Roger Bacon*,

THE TREATMENT OF PNEUMONIA FROM THE POINT OF VIEW
OF THE CIRCULATION*

BY JOHN BRODIE, B.Sc., A.K.C., M.B. (LOND.), M.R.C.S. (ENG.),

Winnipeg

ONE of the commonest, as well as one of the most fatal, diseases we are called upon to treat is acute pneumonia. Recent records of this hospital show that of 279 cases of pneumonia, 70 died, giving a mortality of a trifle under 25 per cent. This result compares not unfavourably with what is usually obtained in general hospitals.

If we ask ourselves the question as to what it is that kills these patients, some of us will put the blame on the heart, others on the vasomotor system; some will say the cause of death is sepsis, while others will point to respiratory failure. Whether or not we agree with those investigators who hold that the commonest cause of death in pneumonia is cardiovascular failure, we must all agree that failure of some part of the circulatory system is an important factor, often leading to a fatal outcome in many of these patients. At least, everybody will admit that the condition of the circulation must always be of definite and serious concern to the physician. It seems profitable, therefore, to inquire into the nature and the extent of the damage usually suffered by the cardiovascular apparatus in pneumonia, and, having obtained as clear a picture of the pathology as is possible with our present knowledge, to consider how we may best treat our patients, particularly from the standpoint of the circulation.

The treatment of pneumonia is still far from satisfactory, in spite of the volume of very valuable experimental research of recent years. Indeed, the assiduous search for a specific cure has only demonstrated how complex the disease really is. The work of such investigators as Dochez,¹ Avery,² Cole,³ Cecil,^{4, 5, 6} and others has taught us to look upon pneumonia not as one disease, but as a complex group of biologically different infections. That is why

previous efforts to produce a specific treatment proved unsuccessful. In spite, however, of the progress made during the last fifteen years, we have to admit, as Cecil himself frankly does, that "much more still remains to be done before a thoroughly satisfactory specific is achieved." Furthermore, it is important to realize that, even with serum at its best, we could not possibly expect to obtain such brilliant results as we get from specific therapy in diphtheria, for pneumonia often attacks middle-aged or elderly people, and particularly those who are suffering from some systemic disease or who are alcoholic.

The problem of pneumonia, therefore, still remains. If a large proportion of pneumonic patients recover, it is not because we have discovered a potent cure, specific or non-specific, but because the disease is fortunately self-limiting. The physician is the determining factor in but a small percentage of recoveries. As Professor Hay,⁷ of Liverpool, points out with truth, "In 100 cases the chances are that about 75 will survive if allowed to do so; 10 to 15 will probably die—doomed from the first. This leaves another 10 to 15 patients whose chances of recovery will depend on the manner in which the case is handled." We shall, therefore, still have need to treat our pneumonic patients individually and symptomatically, and continue to adopt such measures as are calculated to forestall signs of danger.

To attempt to safeguard the integrity of the heart or the peripheral circulation, and to do it intelligently, it is important to obtain some clear ideas about the response of the cardiovascular system to this acute infection. Unfortunately, this is not easy. The mechanism of the failure of the circulation in pneumonia is not yet well understood, for it is no easy matter to give a clear or precise account of the pathology of the circulation. Unlike some of the other infectious fevers, pneumonia produces no definite anatomical changes in the heart. In

* From the Heart Clinic, St. Boniface Hospital, Winnipeg; read at the monthly clinical meeting, Feb. 14, 1929.

typhoid fever, for example, we often find focal necrosis in the myocardium, and in diphtheria we can make out some fatty degeneration and round-celled infiltration. In rheumatic fever also, and in syphilis, we can see infiltrating inflammatory invasions. Not so in pneumonia. Romberg, in some classic experiments on animals, as long as thirty years ago, was struck by the absence of any important changes in the heart in pneumococcal infections, and Aschoff, later, was also unable to find any specific pathological process or parenchymatous change in the myocardium. Since, therefore, anatomical lesions in the pneumonic heart are, according to the majority of competent investigators, infrequent and relatively insignificant, there must be some functional impairment of the heart or of the peripheral circulation to account for the failure of the circulation that admittedly occurs in pneumonia. Although we still have no direct method for estimating myocardial function, we know that there are certain factors in pneumonia that must throw an extra burden on the heart.

It is obvious, in the first place, that the pathological changes in the lung must be held responsible for some impairment in the pulmonary circulation. Kline and Winternitz⁸ made a study of the pulmonary circulation in experimental pneumonia, by employing the method of vital staining, and were able to demonstrate marked impairment. Later, Gross,⁹ of Montreal, made a radiographic study of barium-injected lungs from patients dying of pneumonia. He found that in the areas showing grey hepatisation, the vessels could scarcely be injected at all, and only the large branches appeared patent. Even these were compressed, and ended abruptly. Such was the lack of injection that the whole area appeared strikingly anæmic. This was not so marked in those parts showing red hepatisation, although there also spaces could be seen where the vessels were not injected, and even those showing injection were narrowed and compressed. On the other hand, the healthy parts showed vessels and capillaries excessively dilated, the capillaries having acquired a calibre two or three times the normal, and the whole lobe presented a striking picture of compensatory arterial dilatation. (See Figure).

Taking these facts into consideration, we may

infer that, in order to overcome the gradually increasing resistance to the circulation through the pulmonary vessels, the right ventricle will be forced to contract with greater and greater force. That this inference is correct has been demonstrated by examining pressure curves recorded from the right ventricle. Failure of the right heart will therefore be more likely to develop where there is extensive involvement of the lung or in previously existing mitral or pulmonary disease. This failure may be recognized



X-ray photograph of barium injected lung from a case of lobar pneumonia showing impairment of pulmonary circulation (after Gross).

by such signs as venous distension, cyanosis, pulmonary oedema, enlargement of the liver, weakening of the second pulmonary sound, and by dilatation of the right heart, as seen by x-ray or as found by careful percussion. But the importance attached by the older clinicians to failure of the right heart as the cause of death in pneumonia seems to have been exaggerated, for signs of this do not often appear even in lobar pneumonia.

The disturbance to the respiratory function caused by the pulmonary lesion is responsible, however, for throwing a much more serious burden on the heart. The early alveolar inflammation, and the subsequent alveolar exudation, seriously interfere with the proper aeration of the blood, with the result that the blood

circulating through the lungs is unable to pick up its normal quota of oxygen. Since, therefore, each unit of blood can take up only an insufficient amount of oxygen, more units of blood will have to pass through the lungs in a given period of time, that is, if the tissues are to be supplied with sufficient oxygen, and failure of tissue metabolism is to be prevented. Thus, in order to compensate for imperfect respiratory function in pneumonia, the heart will be forced to increase its output.

Although this compensatory increase in cardiac output is of undoubted benefit to the organism, the heart must suffer from the extra strain. Hence, if it is able to hold out until the defensive forces of the body are able to overcome the infection, recovery will take place. If, however, the increased burden thrown on the heart is too much for it, cardiac exhaustion will occur, and death may ensue. That is why circulatory failure is more common in pneumonia than in typhoid or acute miliary tuberculosis, although the degree of toxæmia is probably of the same order of intensity. That is also why pneumonia is more fatal if it attacks patients already suffering from some cardiovascular lesion, whether valvular, myocardial, or arterial, because the diseased heart has already exhausted at least part of its reserve force, and if driven to increase its output must break down more readily.

The disturbance to the respiratory function may be so marked, however, that even a healthy heart, with all its increased output, will not be able to compensate for the defective oxygenation of the blood. There will, therefore, result some arterial anoxæmia. Thus, in his experiments on arterial unsaturation, Stadie^{10, 11} found that, whereas in normal individuals the arterial blood is saturated with oxygen to the extent of 95 per cent, leaving an unsaturation of only 5 per cent, in pneumonia the unsaturation often reaches 20 per cent or even more. Now we know from the reports of the Anglo-American expedition to the Peruvian Andes that sudden transition from the sea-level to those high altitudes produced a variety of severe symptoms, because the oxygen unsaturation of the arterial blood reached 10 per cent. In pneumonia it is often more than that. Further, if a normal individual is exposed in an atmospheric chamber to an oxygen pressure

which has been so reduced as to produce a degree of arterial unsaturation such as we often find in pneumonia, he develops headache, weakness, vertigo, tachycardia, palpitation, præcordial pain, shortness of breath, disturbances of vision and hearing, with delusions, delirium, and Cheyne-Stokes breathing. It becomes possible, therefore, to ascribe some of the worst symptoms of pneumonia to anoxæmia, and to see how this adds a serious burden to a patient already suffering from the effects of the local pulmonary lesion, such as thoracic pain, cough, expectoration and fever.

It is of interest to note that anoxæmia is more likely to be pronounced in the earlier than in the later stages of pneumonia. For, early in the course of the disease, before hepatization has developed and obliterated the alveolar capillaries, the usual quantity of blood is still able to pass through them. The alveoli, however, being inflamed, there is interference with proper gaseous exchange, and the blood flowing through such an affected area is imperfectly aerated. This portion of blood will, therefore, remain more or less venous in character, *i.e.*, poor in oxygen and rich in carbon dioxide, and, on entering the general arterial circulation, will pollute it. Later, with the development of consolidation, the circulation in the alveolar capillaries gets diminished or abolished, and, since little or no pollution thus occurs, the arterial blood is less unsaturated than before. Hence, as pointed out by Meakins and Davies,¹² the degree of cyanosis, which is proportional to the amount of oxygen deficiency, becomes less marked as consolidation increases. Hence, also, cyanosis is more common in bronchopneumonia, where consolidation is never so complete. As, moreover, this disease usually begins with a bronchiolitis, the terminal bronchioles get blocked very early, with the result that, while the alveoli are imperfectly aerated, the alveolar capillaries remain patent and conduct the usual quantity of venous blood. Pollution is therefore favoured.

It is important to realize the significance of anoxæmia in pneumonia, because it plays a leading part in bringing about cardiovascular and respiratory failure. In the early phases of the disease it is associated with a retention of carbon dioxide, and enhances the effects of this excess. As CO₂ normally acts as a stimulant

to the vital medullary centres, and anoxæmia exaggerates this stimulation, the result will be exhaustion of those centres, with respiratory failure, dyspnœa and cyanosis. In the later phases, when consolidation has become established, there is much less retention of carbon dioxide. On the contrary, the rapid and shallow type of breathing, so characteristic of pneumonia, produces a deficiency not only of oxygen but also of carbon dioxide, which is pumped out of the blood and the tissues. This reduction of carbon dioxide, the "acapnia" of Henderson¹³ and others, especially in the presence of oxygen deficiency, is responsible for a very dangerous condition. For, owing to the deficiency of carbon dioxide in the blood, the respiratory and vasomotor centres are insufficiently stimulated, with the result that the blood pressure falls and respiration becomes progressively weaker. This type of respiratory failure is different from the other, and more insidious, for it is not accompanied by dyspnœa. The cyanosis will also be different, for, instead of the blue or purple colour usually associated with excess of carbon dioxide in the capillaries of the skin, we get the pallid or ashen-gray type of cyanosis due to the lack of carbon dioxide in the superficial capillaries. Death in the later stages of pneumonia may, therefore, be heralded by a type of respiratory failure unassociated with the usual air-hunger, and by a type of cyanosis without the usual blueness. These are more treacherous than the common types of cyanosis and respiratory failure. Thus we see that the anoxæmia produces a dangerous state of affairs, for not only may it force the heart to increase its work beyond its capacity, especially as its blood supply is also polluted, but by accentuating the effects of either too much or too little carbon dioxide, it may bring about failure of respiration and of vasomotor control.

The effects of toxæmia on the heart seem to have been exaggerated, for it is very doubtful if heart failure in pneumonia results from toxic myocarditis. Thus, Newburgh and Porter¹⁴ found that the heart muscle from dogs dying of pneumonia contracted just as long and as forcibly as that from healthy dogs if both were perfused with normal healthy blood. Yet, on reversing this experiment and using pneumonic blood as a perfusate, the healthy heart muscle

contracted less than 50 per cent of the normal and even less than the pneumonic. This illustrates the fact that, although the bad effects of toxæmia on the healthy heart must be considerable yet in a patient suffering from pneumonia the heart gradually adapts itself, with remarkable success, to the progressive increase of toxins in the blood. Apparently, the pneumonic heart gradually achieves a relative immunity to the toxins. There is, therefore, no ground for assuming, as many people still do, that heart-failure occurs in pneumonia because of the direct action of the toxins on the myocardium.

The pernicious results of toxæmia fall, however, with greater severity on the central nervous system, and exert a weakening and paralyzing effect particularly on the vasomotor centre. This loss of vasomotor tone weakens the control of the abdominal vessels by the splanchnic nerves, and ultimately paralyses the peripheral circulation. The blood collects and stagnates in the relaxed vessels of the great splanchnic territory, and the general arterial blood-pressure falls. As, therefore, the heart receives only a fraction of the blood essential for its efficient contraction, the intra-cardiac pressure falls, and failure of the heart occurs secondarily to failure of the peripheral circulation. This is analogous to what occurs in surgical shock and in collapse.

It is, therefore, no exaggeration to say that in few other diseases do adverse conditions so conspire to defeat the functions of the circulation as in pneumonia. The strain on the right heart resulting from impairment of the pulmonary circulation, the widespread pernicious effects of anoxæmia on the whole cardiovascular system, and the weakening of the peripheral circulation caused by the toxæmia, not to mention other factors not so well understood, all conspire to hit the circulatory apparatus in so many vital points that no wonder it often becomes exhausted and finally breaks down under the combined attack.

With these ideas clear in mind as a pathological basis, showing how the heart reacts, and how pneumonia tends to exhaust the whole cardiovascular system, we shall be better equipped to review the various therapeutic measures most commonly employed, and estimate their value in preventing or repairing damage to the circulation. If we possessed a

really effective specific cure which could sterilize the blood, neutralize toxins, and cut short the disease before circulatory exhaustion occurred, the problem would be fairly simple. An effective biological specific cure is, however, still in the experimental stage. In the meantime, we must summon to our aid those measures we have, and use these with understanding and discrimination.

In the absence of an effective specific cure, some clinicians adopt remedies of a non-specific character. There is a large choice of these, from nucleinate of soda¹⁵ and permanganate of potash,^{16, 17} to electrargol and diathermy.^{18, 19} Many believe they thereby achieve therapeutic "short-cuts." It is true that, like most non-specific measures, these sometimes produce some general benefit, particularly in cases with a poor marrow response and clinical leucopenia, or in delayed resolution. But the present state of our knowledge is such that it is not wise to put too much trust in any form of specific or non-specific medication. Pneumonia is a disease where meddlesome fussiness only exhausts the patient and does much harm. It is, therefore, better not to attempt to do too much.

Those who have subjected a pneumonia patient to the usual routine medical examination, and noticed how even that is enough to exhaust him, will realize the supreme importance of complete physical and mental rest. All disturbing influences like pain, insomnia, and the atmosphere of dread and apprehension often caused by loving but too anxious relatives, must therefore be minimized. An opiate, an injection of morphine, or Dover's powder, administered in the early days of the disease, when pain is acute and distressing during the day and is followed by restlessness and insomnia during the night, is a wise measure and will do no harm, so long as there are no indications of excessive secretion in the air passages. Not only does it bring rest and freedom from pain and over-anxiety, but it often deepens respiration and improves the quality of the pulse. Morphine is, indeed, such an excellent cardiac sedative that an attempt has even been made to account for its beneficial action by calling it a "heart tonic." It should be withheld, however, in the presence of undue secretion or abdominal distension, and, in any case,

opiates should be replaced by milder sedatives after the fourth day of the disease.

The condition of the abdomen is of great importance in pneumonia, for if we allow the heart, overburdened as it is by the pathological changes in the lungs, to be further hampered by distension of the abdomen, we are not giving it a fighting chance. Indeed, in patients with old-standing mitral disease, or in those with emphysematous chests, abdominal distension becomes a grave complication. If the diet has consisted, as it should, of milk and water with some cereal decoction, and strained fruit juices with perhaps some glucose, and yet the abdomen shows signs of distension, the diet should be immediately reduced to water and orangeade, a simple enema given, and, if necessary, a rectal tube inserted for removing flatus. These measures will usually be effective, but if not an intramuscular injection of pituitrin, 0.5 to 1 c.c., should be given.

With regard to the use of digitalis, there is still no uniformity of opinion with respect to its value as a routine measure in all cases of pneumonia, although it was first recommended for this disease as long ago as 1799. Even for those cases associated with old-standing heart-disease, there was, until recently, a sharp difference of opinion as to the exhibition of digitalis. On the one hand, there was British opinion represented by MacKenzie and Brunton, who held it to be of no value whatever. Sir James MacKenzie,²⁰ for example, said explicitly, "I have never seen much good follow the administration of digitalis in acute febrile states." German opinion, on the other hand, was more favourable, and Romberg²¹ insisted on the importance of giving digitalis from the outset to all cardiac patients who developed pneumonia.

After much experimental work, the consensus of opinion now is that digitalis acts as well in the presence of fever as in non-febrile states. Thus, Cohn and Jamieson²² found that, if given by mouth in pneumonia, digitalis produced a lengthening of the P-R interval and a depression in the T wave of the electro-cardiogram, just as it did in the non-febrile heart. The dose and the time required to produce those changes were the same. It is, therefore, agreed by everybody nowadays that digitalis is indicated in those cases of pneumonia that are associated with auricular fibrillation or conges-

tive heart failure. As, however, these occur but seldom in the course of pneumonia, the question still remains whether there is any valid reason for giving digitalis in the presence of a normal rhythm and in the absence of such signs as peripheral œdema, hepatic congestion or venous engorgement. On this question opinion is still divided. Thus, one writer sums up his advice in one sentence. "Leave the heart alone if it is doing its work, that is," he says, "if there is no œdema and no engorgement of the veins." The tacit assumption of this writer is, apparently, that so long as there is no œdema or engorgement, the heart is doing its work efficiently. This, however, cannot be true. A man may for a long time show no œdema or engorgement, and yet may have definite organic heart disease with but a limited cardiac reserve. A patient suffering from angina pectoris seldom shows signs of congestive failure, and yet he may be in danger of sudden cardiac death. It is true that in pneumonia there are usually no signs of congestive failure, and yet all is not well either with the heart or with the general circulation. For, as we have seen, not only is the heart called upon to do more than its normal quota of work, especially on a polluted blood-supply, but whenever vasomotor tone falls, it loses even that support which it is entitled to get from an efficient head of pressure maintained normally by the peripheral circulation.

The opinion is sometimes expressed, even by some clinicians of distinction, that digitalis is of benefit only in cases of irregular tachycardia, such as is found in auricular fibrillation, or in cases of flutter, and that if it does not slow the pulse, it can be of no use. Clinical experience, however, proves that apart from its depressing effect on the junctional tissues, digitalis must have some direct beneficial effect on the muscle of the heart. For it can clear up œdema and congestion and ascites, even where the rhythm is normal, and without slowing the pulse. And this diuretic action of digitalis, contrary to that of caffeine, is not due to its action on the kidneys, but results from the beneficial influence exerted on the heart muscle, which is thus enabled to drive the dropsical fluid with greater force to the kidneys. By virtue of its direct action on the myocardium, digitalis increases its contractility. The muscle fibres thus shorten and

contract more efficiently, produce more complete emptying and less residual blood in the cardiac chambers, and, therefore, expel an increased quantity of blood per unit of time. In short, by increasing the contraction, digitalis increases the efficiency of the heart. Although we have no method for measuring the strength of cardiac contraction, yet it has recently been demonstrated, by means of moving x-ray pictures, that digitalis produces a distinct increase in the extent of ventricular excursion, not only in auricular fibrillation but also in the presence of a normal rhythm. For this reason, digitalis ought to be of benefit in pneumonia also. By enabling the ventricles to empty themselves more efficiently, and thus preventing the accumulation of residual blood, it should prevent dilatation, which is the preliminary to heart failure. As a matter of fact, Levy²³ succeeded in demonstrating that in pneumonia there is, indeed, a tendency to cardiac dilatation, and that this tendency is demonstrably restrained by digitalis. As dilatation means encroaching on cardiac reserve, we may logically say that digitalis conserves the reserve energy of the heart in pneumonia. Another and more obvious advantage in giving digitalis is that, should fibrillation or flutter or dropsy supervene, the heart is already partly digitalised, a fact that may be responsible for saving the patient's life.

While, therefore, it is universally agreed that digitalis should be given in pneumonia to those who have old-standing cardiac disease, or even to elderly patients with vascular disease, there is reason for the exhibition of digitalis as a routine measure to all cases of pneumonia. In order, however, to avoid subjecting a pneumonic patient to the toxic effects of over-digitalisation, 45 to 60 minims of the tincture, or the corresponding dose of the powdered leaf, should be given daily until the fifth day, and then the amount reduced to 30 minims per day, while watching for and avoiding the usual toxic effects of the drug.

Oxygen is often given in pneumonia. It is frequently administered just before death, when it exerts a remarkable moral influence, not indeed on the patient, but on his friends and relatives, who are now convinced that everything possible has been done, and that nothing in human power can now save the doomed sufferer. Since the war, however, we have been realizing

more and more the meaning of anoxæmia, and hence the significance of oxygen deficiency in pneumonia. This has led to the introduction of more adequate methods of administering oxygen, and, as the result of many reliable reports of its effective use, we have been forming a decidedly more favourable opinion of it than in the past.

It was Professor Haldane,^{24, 25} of Oxford, who, during the war, first showed how to administer oxygen with effect in the treatment of acute pulmonary œdema due to war-gas poisoning. Stadie, Meakins, and others proved that the degree of arterial oxygen deficiency corresponded to the degree of cyanosis, and that both could be easily regulated by the administration of oxygen in sufficient dosage. We are now, indeed, beginning to look upon oxygen as a drug, and, like all drugs, it has a minimum dose, a maximum dose, and an optimum dose. Since ordinary inspired air contains about 21 per cent of the gas, it is agreed by all investigators that the old-fashioned method of administering it by means of a funnel is quite useless. Even if given at the rate of 2 litres per minute, the proportion of oxygen in the nasopharynx reaches barely 24 per cent. The administration of oxygen cannot, indeed, be considered a therapeutic measure, unless the inspired air contains anything from 30 to 60 per cent, and 40 to 50 per cent seems to be the optimum dose in the average case.

The nasal catheter method of administration, first introduced by Captain Stokes for cases of war-gas poisoning, is satisfactory in mild cases of cyanosis, because at the rate of two litres per minute the percentage of oxygen in the nasopharynx may reach 30 per cent or even a little higher. For more severe cases, however, a higher concentration is essential, and this can be attained best by means of an oxygen chamber similar to that at the Rockefeller, the Presbyterian, or the Rochester hospitals, or by means of a portable tent, such as the one described by Barach.²⁶ With the aid of Barach's apparatus, which has the advantage of being simple, cheap and portable, it is possible to get a concentration of 40 per cent even with one litre per minute. Barach²⁷ found this concentration sufficient to clear up cyanosis, relieve dyspnœa, diminish restlessness, lessen any tendency to delirium, and promote sleep. Further, Boothby and Haines²⁸ were able to demonstrate that

oxygen produced even a fall of temperature. It is, indeed, the conviction of some investigators that, in severe cases of pneumonia with marked cyanosis, the administration of oxygen is a life-saving procedure. There can be no doubt, however, that its effective administration in adequate dosage is supportive, and tends to prolong life until such time as the mechanism of immunity is able to gather sufficient force to accomplish recovery. Stadie has shown that cyanosis of the finger-nails and lips that can just be detected, corresponds approximately to 10 per cent oxygen unsaturation; definite cyanosis corresponds to about 15 per cent; and marked cyanosis to about 20 per cent, or more. It is well to bear these figures in mind as rough but useful clinical estimates, as they enable us to adapt the dosage of oxygen to the degree of cyanosis.

A few words must now be said about the so-called cardiac stimulants, — drugs, namely, that are commonly employed in acute circulatory emergencies. There is a vast volume of experimental research and clinical investigation recorded about the action of these drugs, but the evidence is often both conflicting and confusing. This is due to the fact that, not infrequently, what is diagnosed as acute cardiac failure is, strictly speaking, not due primarily to the heart at all, but is secondary to failure of the peripheral circulation. Since modern research is attaching more and more importance to the peripheral circulation, we shall have to learn to differentiate more strictly between cardiac failure and vascular failure. This is not merely a matter of academic interest, but has a direct bearing on practical treatment.

With regard to the use of cardiac stimulants in pneumonia, it is well to remember that, if heart failure occurs, it does so primarily not because the myocardium has been poisoned or weakened by the toxæmia, but because of overwork and exhaustion due to the increased load. In that case, it is questionable whether it is good treatment to endeavour to stimulate the heart to still further and more exhausting efforts. It is not often wise to whip a tired horse. As a matter of fact, however, some of the drugs often classed as stimulants really act as cardiac sedatives, and prevent overcompensation, which is responsible for cardiac exhaustion in pneumonia. Even digitalis, the supreme cardiac stimulant, owes some of its

most beneficial action to the fact that, by depressing conductivity, it lowers the ventricular rate and prevents exhaustion of the ventricles. It has even been demonstrated that, in certain cases of heart failure, digitalis reduces the cardiac output. Hence its sedative, as well as its tonic influence, must be borne in mind. Similarly, the administration of oxygen, by reducing anoxæmia, also reduces the necessity for the increased cardiac output; while one of the reasons for giving morphine in the early stages of pneumonia is because it also acts as a cardiac sedative.

We may now consider the following six drugs, as representing the commonest of the so-called stimulants often employed with the object of supporting an acutely failing circulation. They are alcohol, strychnine, adrenalin, pituitrin, caffeine and camphor.

Alcohol, the most favoured of these, is commonly regarded, not only by the general public but also by many general practitioners, as the cardiac stimulant par excellence. It is the common belief that alcohol possesses some unexplained specific power in stimulating the heart. So far, however, we have no scientific evidence to prove that it can stimulate the heart in any degree. On the contrary, there is some evidence that the presence of alcohol in the blood inhibits the vital processes which are responsible for the production of antibodies. Hence, many of the more scientific clinicians believe that to give, under the guise of a cardiac stimulant, large and repeated doses of a depressing drug like alcohol, which on absorption, moreover, tends to interfere with the immunizing process upon which recovery from pneumonia depends, cannot be sound treatment. We know, of course, that a small amount of concentrated alcohol, like brandy or whiskey, will revive a patient in fainting. Some momentary improvement in the circulation undoubtedly occurs, but this improvement follows so soon after administration that it cannot possibly be ascribed to absorption. It can only be accounted for by assuming a reflex stimulation of the medullary centres. After absorption, however, alcohol undoubtedly causes some redistribution of the blood, which is manifested by flushing. The flow of blood through the skin seems to be increased at the expense of that in the internal organs. In virtue of this

action we might suppose it could be of some use in an ordinary chill. Here, it might act beneficially by overcoming the sudden reflex constriction of the vessels of the mucous membranes of the nose and throat that follows upon sudden cooling of the surface of the body. But even in this case its action is not stimulating but sedative. As a matter of fact, as Cushny²⁹ points out, "The action which lends alcohol its value in therapeutics is not its stimulant but its narcotic action." As a sedative, alcohol has its uses. It may be comforting during the initial phase of pneumonia when given in hot drink during the rigor. As a sedative it may also be of benefit, when given either alone or combined with hypnotics, in procuring rest and sleep for an over-excited and nervous patient suffering from pain and insomnia. There is, further, no objection on therapeutic grounds if dilute alcohol, in the form of wine, for example, is ordered during the stage of convalescence. But the administration of fairly large and repeated doses of strong alcohol, with the avowed object of preventing or counteracting failure of the heart, seems to be unscientific, and may do harm by hampering the production of immunity, which is after all the sole curative agency in pneumonia.

Strychnine used to be, and often still is, a favourite cardiac stimulant. It has been demonstrated, however, by Parkinson and Rowlands,³⁰ among others, that it exercises no specific action on the heart. Even as a respiratory stimulant it is unsatisfactory in pneumonia, for it increases the rate of breathing at the expense of the depth.

There is more reason for the use of adrenalin. When the blood-pressure falls and the heart sounds grow feeble, as not infrequently happens in pneumonia, the injection of adrenalin may produce quite an improvement in the circulation. By constricting the peripheral vessels directly, especially those of the splanchnic area, it produces an immediate rise in the blood pressure, and by stimulating the accelerator nerve-endings in the heart it produces a stronger systolic contraction and a more complete emptying of the cardiac chambers. Adrenalin, however, can be a two-edged weapon, for by increasing the irritability of the heart it may favour the development of fibrillary contractions or ventricular fibrillation, which in man is incompatible

with life. Hence, the use of adrenalin needs caution, and it is safer to give small repeated doses than a single large dose. If the blood pressure shows signs of falling, 5 minims of a 1-1000 solution can be injected subcutaneously, and repeated if necessary. If, however, cardiovascular collapse threatens, the same dose may be given intravenously. Not infrequently this will be of distinct benefit. Even when the pulse and respiration become almost imperceptible, the blood pressure falls to zero, and the patient turns pale, cold and clammy, an intravenous injection will sometimes rapidly raise the blood pressure and restore consciousness. Should an intravenous injection prove ineffectual, an intracardiac one may and should be tried as a last resource.

Pituitrin is also useful under similar circumstances, although rather less so than adrenalin. For, as it does not discriminate between the splanchnic and the other parts of the vascular system, it is unable to produce the necessary redistribution of the blood.

Caffeine is still regarded by many as a direct cardiac stimulant. As Cushny³¹ points out, however, "its reputation as a cardiac stimulant may probably arise from its efficacy in removing dropsy in heart disease, but this is the result of its renal action, and the heart is not affected directly." Even as a respiratory stimulant its action is weak and fleeting. Yet, as Meakins and Davies¹² demonstrated, it can increase pulmonary ventilation at a lowered level of CO₂ tension in the arterial blood, and this it does by increasing not only the rate of respiration but also the volume. It must be remembered, however, that caffeine increases any tendency to nervous irritability, insomnia or delirium.

Lastly, with regard to camphor, a drug administered as a cardiac stimulant with almost religious constancy in German-speaking countries, the most divergent results have been obtained experimentally. There is no proof, however, that it acts on the heart muscle, although it appears to exert some reflex influence on the medullary centres.

Many other remedies have, of course, been employed in this complex and dangerous disease, but perhaps it is wisest to grasp the mode of action of the more reliable drugs, and to use these with discrimination.

Objection might perhaps be raised that too

much attention has been given to the proper use of oxygen, digitalis, hypnotics and certain more or less useful drugs for supporting the circulation in acute emergencies. The medical pessimist might argue that all these measures are merely palliative, and the therapeutic nihilist might even sweep the whole scheme aside as of no use, since the cause of the pathological condition is not thereby removed. Perhaps what Haldane says of oxygen therapy may be true of the other measures as well, and serve as a useful corrective. As a physiologist, he denies categorically the validity of such deprecatory arguments. "The body," he declares, "is no machine, but an organism tending to maintain or revert to the normal, and the respite afforded by such measures as the temporary administration of oxygen is not wasted but utilized for recuperation."

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training other than what they have acquired from experience and practice. The roentgenologist of to-morrow must be a physicist. Physics is to the science of roentgenology what physiology and pathology are to internal medicine. Without this fundamental basis, the radiologist cannot hope to attain a high degree of proficiency. The roentgenologist must be a technician. Excellent as our non-professional technicians may be, we can expect them to attain only the standards we lay down for them. A major fault of technology, as we see it, is inability to criticize a

given film and determine what alterations should be made to attain the desired end-result.

In conclusion, we are looking forward to the time when our North American universities will follow the lead of certain British institutions, and provide us with detailed courses and diplomas in the physics and application of the roentgen ray.

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POLIOMYELITIS IN MANITOBA IN 1928*

By O. J. DAY, M.B.,

*Attending Physician Children's Hospital,
Winnipeg*

THE organization undertaken in Manitoba to combat the epidemic of poliomyelitis in 1928, was instituted by the Honourable Dr. E. W. Montgomery, Minister of Health and Public Service. He utilized the services of the Medical Research Committee of the University of Manitoba, to whom all credit is due for the very efficient manner in which they conducted the work. Any information, new or confirmatory, which was unearthed in this study was entirely due to their efforts. The tremendous strength of organized medicine, where team-work and co-operation are possible, as compared with the feeble efforts of the lone-handed physician, is undoubtedly the most important lesson we learned from the epidemic.

Poliomyelitis first appeared in Scandinavia in 1881. From that year till the present it has been endemic there, reaching its height in the year 1911, when there were 5,000 cases. No country has escaped this disease. It has occurred in all climates, but northern Europe and America have had the largest epidemics. The epidemics in the British Isles have been small, but, as in many other countries are growing yearly in magnitude. The first epidemic to be reported on this continent occurred in 1894, in Vermont, U.S.A. In 1916, an epidemic unprecedented in extent and

severity occurred in the United States and Canada. There were 13,000 cases in New York State, two-thirds of which occurred in New York City. No large epidemic has occurred since. The fact that only 70 cases were reported in 1917 in New York State, is interesting, and a sudden drop in the number of cases is characteristic of most epidemics.

We have no complete epidemiological reports on poliomyelitis in Canada prior to 1924. We did have poliomyelitis before that date, but it is difficult to surmise how many cases actually occurred. There were 150 cases in 1924; 200 cases in 1925; 200 cases in 1926, 680 cases in 1927 and 788 cases in 1928. Most of the cases (400) of 1927 were in British Columbia and Alberta. Of the 788 cases in 1928, 435 were in the eastern half of Manitoba, and 90 were in Alberta.

From our knowledge of the incidence of this disease, we must reconcile ourselves to the fact that we cannot escape an annual visitation of it at some point in our large country. For your discomposure, it has been said by some epidemiologists that, since it appeared in epidemic form in the Pacific States and British Columbia, on the last occasion, in 1927, it seems to be travelling eastward. We in the west hope that it continues to travel, but would wish that it would travel northward to the region of the Barren Lands!

* Paper read at meeting of Ontario Medical Association, Hamilton, May, 1929.

I do not believe that there is any disease that can frighten the people so profoundly, as poliomyelitis. In Winnipeg, last year, it incited a terror among them much like that caused by the air-raids during the war.

In the Province of Manitoba, the 435 cases were distributed as follows: 237 cases in the City, 67 cases in the suburbs, and 133 cases in the rest of the province. There were only 33 cases in that portion of the province west of Lake Manitoba. This number represents a case incidence of about one in a thousand of the population, which is the usual incidence in most large epidemics, but is often far exceeded in small communities. There were 37 deaths—that is a mortality of 8.7 per cent.

One cannot help reflecting on the complacency of the people towards diseases that are constantly with us and take a far greater toll in lives. For example, in the three winter months when the pneumonias were at their height there were 63 deaths from this cause alone in Manitoba, and while poliomyelitis was raging, though it caused but 35 deaths, there were 118 deaths under 4 years, in the city of Winnipeg from gastro-intestinal diseases, which passed unnoticed. Yet the public is decidedly perturbed by the knowledge that poliomyelitis is about. Organized medical bodies are confronted with these alternatives—either to ignore the public and try to conceal from the people the knowledge of the presence of an epidemic, or to give them full information through the press. The latter plan was adopted in Winnipeg. At a special meeting of the Winnipeg Medical Society, poliomyelitis was discussed, and, among other decisions, a Committee was selected to prepare suitable articles for the newspapers. These appeared daily for a week, and were decidedly instructive. It is my opinion that any information given to the people in an event like this should carefully attempt to allay their alarms by acquainting them with the knowledge that the mortality is not so dreadful, the sequelæ not so serious, and that the incidence only averages one in a thousand of the population.

This epidemic began with a single case at the end of June, and there were only 21 cases in July, most of these in the latter half of the month; 143 occurred in August; 231 in September; 35 in October, and 5 in November. The

epidemic reached its peak during the first week in September. Of the deaths, 2 were in July, 17 in August, 15 in September, and 2 in October.

As to the age incidence; 30 per cent were under 5 years; 35 per cent were between 5 and 10 years; 18 per cent were between 10 and 15 years; 10 per cent were between 15 and 20 years; 3 per cent were between 20 and 25 years and 3 per cent beyond this age.

Aycock says that in concentrated populations the peak of incidence is between 2 and 3 years, while among the rural population the age incidence is later. This difference in age distribution, notwithstanding the fact that the incidence of poliomyelitis is greater in rural sections than in cities, suggests that with the concentration of population, and, as may be assumed, with greater personal contact, there is a widespread distribution of the virus, resulting not in greater incidence than in the rural sections but in a widespread immunization. The peak of age incidence in the epidemic in Manitoba was slightly over five years. The age incidence was older in the province at large than in the city. The sex incidence was 56 per cent males, 44 per cent females—the usual proportion for most epidemics.

The fact that the virus has been isolated is generally admitted. It was first discovered that it was filterable by several independent workers in France, Germany, and the United States, in the years 1909 to 1912. Flexner and Noguchi in 1913 announced that they had isolated the organism which they referred to as "globoid bodies." There is an impression abroad that the "globoid bodies" are indefinite structures; as a matter of fact they are definite organisms, though exceedingly small. Rosenow has made studies of the cultivation of a streptococcus which he maintains is the causal agent of the disease. As yet his findings have not shaken the confidence placed in the work of Flexner and Noguchi. Amoss says that the invasion of the streptococcus is an agonal event.

The mode of transmission of the virus is the greatest problem awaiting solution, and in this direction, the Winnipeg Committee has made some contribution. In this epidemic there were 13 families investigated in which there were 2 or more definite cases in each. There were 12 more families in each of which there were 2

reported cases, or a second, doubtful. Contact was definitely established in 8 more instances.

The occurrence of multiple cases in one family is greater in this epidemic than has usually been the case. In epidemics where the incidence has been recorded, multiple cases amount to 4 or 5 per cent. In Vermont, it has been observed that, almost invariably, these multiple cases occur nearly simultaneously, suggesting infection from the same source, rather than from one to another. This was not the experience in Manitoba. A lapse of 6 or 7 or more days intervened between the onset of two cases in a given family in 14 instances; sufficiently often to impress on one the direct transference of the disease from one patient to another individual.

The infection is transmitted, it is thought, by the nasal secretions, via the naso-pharyngeal mucous membrane to the central nervous system. The existence of healthy carriers has been proved, but the complete solution of the transmission of the disease is by no means settled.

Many of the other infectious diseases—chicken pox, measles, diphtheria, scarlet fever, whooping cough, can be exactly followed in their peregrinations. So, too, can an outbreak of typhoid fever be traced to its origin. Not so with poliomyelitis! It is very mystifying and very intriguing.

Time forbids any prolonged consideration of the symptomatology. The clinical classification of the types outlined by Peabody, Draper and Dochez is most inclusive and adaptable: (1) the non-paralytic or abortive type; (2) the spinal type, in which the disease is one of the lower motor neuron, the common form; (3) the cerebral type, in which the upper motor neuron is involved.

This classification does not form a basis for clean-cut differentiation as does that of Wickman, whose description of poliomyelitis is almost a classic, but whose classification has lost favour because of its complexity.

A typical attack of poliomyelitis presents a fairly characteristic picture, and if the possibility of its occurrence in the season in which it prevails is borne in mind one should be awakened into a suspicion of its presence.

The onset is sudden with fever and malaise. The child comes in from play to lie down. He

complains of headache and feels ill. Moreover, he looks ill, to a greater degree than would be the case in most febrile states. In bed he desires quiet and solitude, and resents being molested. He turns away from his examiner and lies curled up in bed. The face is flushed, the skin moist, the tongue dry and furred. The expression is one of distress and anxiety. The eyes are dull.

On examination there is rebellion and crying. There seems to be generalized pain; sometimes acute hyperesthesia. It has been said that the severity of tenderness in the muscles is some guide as to the site of the paralysis that may follow. The response of the deep reflexes is variable. Sometimes it is very active, oftener completely gone. The superficial abdominal reflexes are often quickly abolished. A decided *tâche cerebrale* is frequently seen. Kernig's sign is common, though not well marked. Stiffness of the neck is slight or of moderate degree. Stiffness of the whole spine, or "poker back," is the most common and unusual sign to aid one in an early diagnosis. A child presenting these signs and symptoms should be suspected and should have a lumbar puncture performed without delay.

The Winnipeg Committee have tabulated the occurrence of the signs and symptoms in the epidemic they studied. I will not recite the complete analysis, but a few of the most frequently encountered features are as follows:

Fever	87.5	per cent
Frontal headache	80	"
Stiff, sore neck and back.....	73	"
Lumbar pain	50	"
Anorexia	46	"
Malaise	48	"
Vomiting	41	"
Pains in the limbs.....	37	"
Irritability and restlessness....	37	"
Paresis	33	"
Drowsiness	26	"
Constipation	24	"
Nausea	17	"
Paralysis	17	"
Tremor	13	"

Less frequent symptoms were coryza, hyperæsthesia, chills, rash, interseapular pain, occipital headache, chest pain, sore throat, vertigo, general weakness, insomnia, diarrhœa, diaphoresis, epistaxis, delirium, girdle pains. One notable and unexpected feature about this disease is the absence of convulsions.

The commoner physical findings were found

by these observers to occur in the following percentages.

The spine sign.....	73 per cent
Rigid neck	52 "
Kernig's sign	36 "
Paresis or paralysis.....	49 "

The knee jerks were exaggerated in 21 per cent and diminished or absent—usually the latter—in 51 per cent. The abdominal reflexes were absent in 39 per cent. An infected throat was found in 40 per cent and an adenitis in 21 per cent.

TREATMENT

At present, convalescent serum seems the most logical form of treatment to use. Treatment with urotropine, adrenalin, and hypertonic saline intravenously, has not given encouraging results. Experimentally, Flexner proved that urotropine by the mouth increased the resistance of monkeys to the infection. A dose of from one-half to five grains three times a day is recommended for use as a helpful prophylactic measure.

The basis for serum treatment rests upon the observation that immune bodies are present in the blood of recovered cases. In the beginning, and in most cases since where it has been used the serum has been given intrathecally or intravenously. In Winnipeg it was administered intramuscularly. This method was recommended by Dr. Cadham for the following reasons: that the serum is absorbed into the blood stream swiftly; that the administration is easily accomplished; that no undesirable symptoms or accidents occur; that no matching is required; and that intraspinal injection does not get directly at the lesions, as one might think it would.

That the results of serum therapy are hopeful is the opinion of most observers, and we in Winnipeg are distinctly of that opinion. Peabody is not convinced. But it is a difficult question to decide, and the most certain means of solution would be to treat only alternate cases in a given epidemic and compare results, if one had the temerity to attempt it. Draper has said that cases in which the cell count exceeds 100 are severe cases, and where it exceeds 500 paralysis is bound to ensue. If so, with careful cell counts in cases treated by serum, it would seem possible to measure the

worth of this form of therapy. In Winnipeg, the value of serum therapy were adjudged by a comparison of results in the treated and untreated cases. I think they will stand the most critical scrutiny.

One hundred and sixty-one cases were selected for their report. The bases of selection were: (1) availability, (2) an accurate diagnosis, (3) reliable records.

Of these 161 cases, 74 received early treatment. Sixty-nine, or 93 per cent, completely recovered, 4 showed residual paralysis, and there were no deaths.

Serum was given to 33 cases after the advent of paralysis. Seven, or 22 per cent, completely recovered; 15, or 45 per cent, showed residual paralysis; and 11, or 33 per cent, died.

Fifty-four received no serum; 34, or 53 per cent, showed residual paralysis; and 6, or 11 per cent, died.

The Committee anticipated the observation that the virus becomes attenuated in the latter part of the epidemic. They demonstrated from their results that this is a fact.

They compared the results of the treated and untreated cases month by month, and arrived at the same conviction of the efficacy of the serum. For example, in September, of 22 cases untreated 36 per cent made a complete recovery; while, of 50 cases treated with serum 94 per cent completely recovered. Better results are not reported in the literature. The serum was Wassermann tested; after the addition of 0.25 per cent of tricoresol, it was put up in separate doses of 25 c.c. each.

It is desirable for each large centre to depend on its own resources for the necessary serum. To apply to other cities takes too much time and it cannot be foretold when they, too, may need all that is available. Nor are any but the earliest cases of an epidemic suitable as donors, unless the epidemic is of long duration. Donors should be paid. They should not be bled too freely but should be encouraged to return for repeated contributions. In Winnipeg an acute shortage was felt until a suitable appeal for volunteers was made through the newspapers, after which there was no shortage. The serum only should be transported to a distance. Whole blood is unsuitable.

If an outbreak of this disease should occur in a community, the people will be anxious to

know what preventive measures can be taken. That such advice may be available early, there is no better medium than the press to spread it. Of course, to be sound, it should be prepared by the medical profession.

In Vermont, very definite public health legislation is enforced in respect to this disease. Their attitude towards its control is considered judicious. During an epidemic, travel, and visiting are forbidden, except when absolutely necessary. It would seem that this is a wise precaution, when motor travelling is so prevalent. Definite instances are known in Manitoba where cases occurred while away from home. And with the people in a highly nervous state, there will be many who will be willing to escape by motor to some distant place where the disease has not made its appearance. This is manifestly unsafe and unfair.

Children should not mingle in crowds or play in groups. They should not roam. Personal cleanliness and good respiratory manners should be observed. The killing of flies and insects, the avoidance of pet animals, the washing of fruit and vegetables, are precautions that may appear ridiculous, but one should not neglect them.

The chairman of this committee was Dr. C. R. Gilmour, Professor of Medicine—the Secretary, Dr. A. T. Cameron, Professor of Biochemistry. They appointed Dr. John M. McEachern, Dr. Mary Mackenzie, Dr. Bruce Chown, and Dr. Lennox Bell, with one or two internes, to do the actual investigation. Dr. Fred Cadham, Provincial Bacteriologist, was responsible for the collection, preparation, and distribution of the convalescent serum used. Dr. William Boyd, Professor of Pathology, was responsible for the investigation of the pathology of the epidemic. Dr. A. J. Douglas, M.O.H. of Winnipeg was, as always, a great source of help to the whole profession and to this committee.

The Great West Life Assurance Company have printed for distribution a complete report of the epidemic, prepared by this committee.

VISUALIZATION OF A CYSTOCELE BY CYSTOGRAM*

By H. GURTH PRETTY, M.D.,

THE term cystocele implies a vesical or vesico-urethral hernia through the supports at the base of the female bladder, which have been stretched or torn as result of trauma. Childbirth is by far its most common contributory cause, since less than 5 per cent of cases occur in nulliparæ. Hypertrophy and laxity of the anterior vaginal wall must not be confused with cystocele, nor must the degree of cystocele be considered to bear a direct relation to the symptoms. The symptoms however occur in proportion to the degree of irritation of the trigone of the bladder; hence, the more the trigone is involved by the cystocele the more acute are the symptoms.

Normally, a strong musculo-fascial layer known as the pubo-vesico-cervical fascia, passes from the back of the pubes to the lateral aspects of the cervix uteri and becomes continuous with the rectal fascia, taking origin on the posterior aspect of the symphysis pubes, at the junction of the upper and middle third of the vertical

plane. The base of the bladder rests directly and is supported by the pubo-vesico-cervical fascia, which, as a result of the prolonged second stage of labour, is stretched or lacerated, thereby producing a cystocele. If, however, only that part of the pubo-vesico-cervical fascia which supports the neck of the bladder is injured, incontinence may occur without clinical cystocele. Incontinence in this case is due to sagging of the trigone of the bladder rather than injury to the urethral sphincter. A very slight hernia of the bladder through the pubo-vesico-cervical fascia (pillars of the bladder) immediately below the trigone sets up a trigonitis which will give rise to the typical triad of frequency, urgency, and dysuria.

Under such conditions the urine is usually negative in all respects; there is very little evidence of sagging of the anterior vaginal wall when the patient is standing and bearing down; clinically, there is not a cystocele. Finally, cystoscopic examination fails to reveal the sagging of the trigone of the bladder. Nevertheless, there are numerous instances in which the symptoms have been entirely relieved by merely folding the pubo-vesico-

* This paper was read before the Gynecological and Urological sections of the Canadian Medical Association meeting, Montreal, June, 1929.

From the Gynecological Clinic of the Montreal General Hospital.

cervical fascia under the base of the bladder.

En passant, it may be mentioned, that in the clinic, it has been frequently noted that multipara complaining of frequency and dribbling not only have a cystocele but in addition diabetes mellitus. Furthermore, in a review of our cases, the observation has been made that many patients complaining of cystocele symptoms, especially those in which prolapse is complete, have a diminished tolerance and delayed assimilation for carbohydrates. Herein lies the relationship between the urologist and the gynecologist, since this type of patient seeks advice from the urologist, who having made a complete examination of the urological tract finds nothing to account for the frequency, and therefore refers the patient to the gynecologist. The mediator between the urologist and the gynecologist has been found in the x-ray department. By means of a cystogram, *i.e.*, an x-ray plate of the pelvis and bladder after the injection of 200 to 300 c.c. of silver iodide solution, the degree of herniation of the bladder may be accurately determined. Therefore, the cystogram will confirm the diagnosis in all cases of suspected herniation through the pubo-vesico-cervical fascia. Furthermore, if a cystogram be taken of an obvious case of cystocele, and the degree of herniation estimated from it prior to the case going to operation, it may be compared with a post-operative cystogram. By this method we have an absolute check on the operation for repair of the cystocele. I may say that this method has been a very great aid in checking up the post-operative results, has entirely disproved the efficacy of some operations, and at the same time has pointed out weak points in others.

The following figures illustrate the anatomical positions of the bladder as seen in the normal, the traumatized, and the repaired pelvis with special accentuation of the pillars of the bladder, whereas the cystograms are antero-posterior views of the injected bladder. In each case the figures are so arranged that the cystogram corresponds to the preceding anatomical sketch.

In consideration of the normal pelvis let us take an adult virgin pelvis, shown in Figs. 1 and 2. In Fig. 1 the bladder is seen to be situated between the symphysis pubis and the cervix uteri, the base of which is supported by

the pubo-vesico-cervical fascia. The base of the bladder is funnel-shaped, and in this position it is completely drained by the urethra. The cystogram of the same pelvis (Fig. 2) shows the relation of the base of the bladder to the symphysis pubis; its base line corresponds to the junction of the upper and middle third of the vertical plane of the symphysis pubis, this being the point of attachment of the pubo-vesico-cervical fascia to the symphysis pubis. A cystocele is therefore diagnosed by cystogram if there be any sagging of the base of the bladder below a line drawn at right angles to the vertical plane of the symphysis pubis through the junction of the upper and middle third.

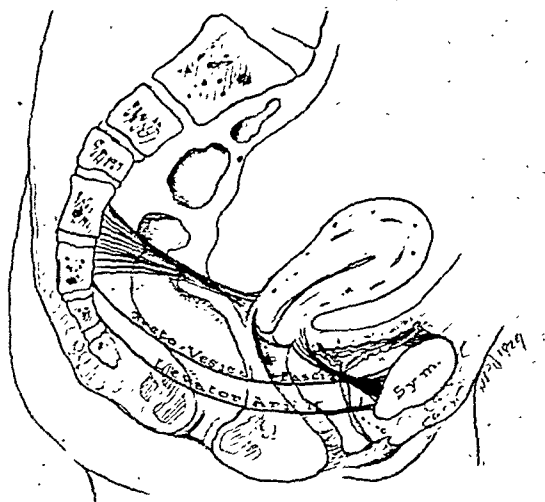


FIG. 1

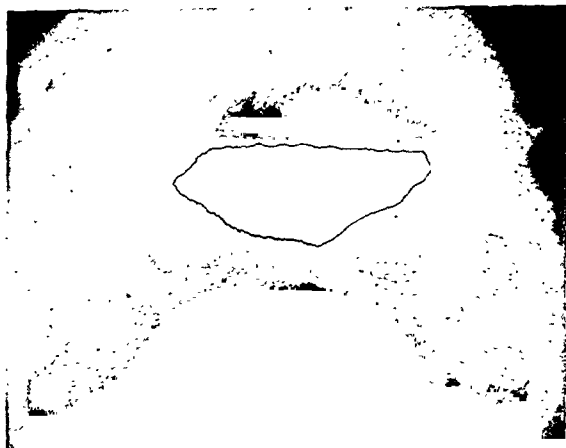


FIG. 2

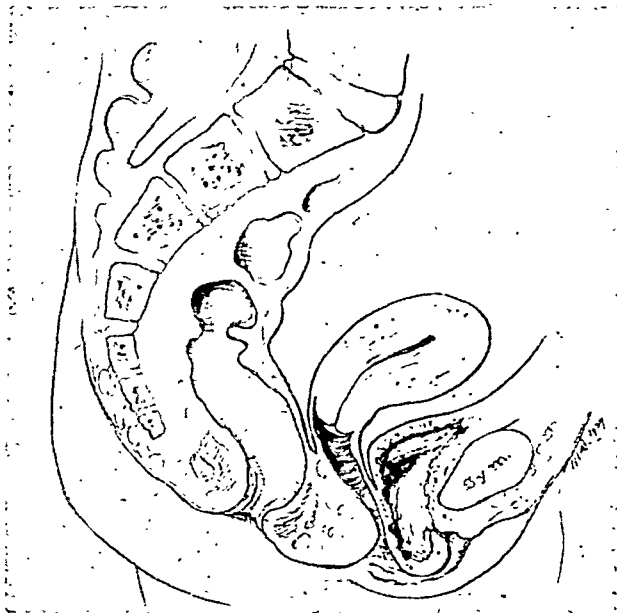


FIG. 3

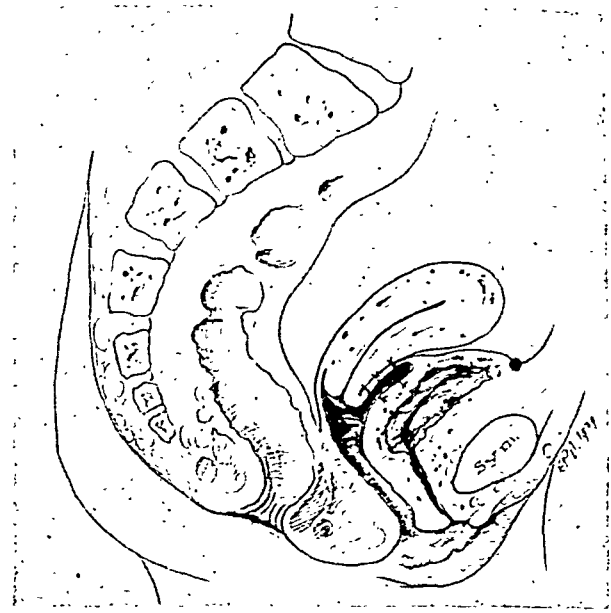


FIG. 5

The traumatized pelvis, a result of child-birth, may show a mild, moderate, or severe cystocele, and occasionally procidentia.

A moderately severe herniation of the floor of the bladder through the pubo-vesico-cervical ligament resulting in a high level outlet to the bladder, giving rise to residual urine, may be seen in Fig. 3, with its corresponding cystogram (Fig. 4), showing the base of the bladder corresponding to the lower border of the symphysis pubis. The post-operative cystogram of the same case (Fig. 6), repaired after the method of Fig. 5, in which the cystocele was reduced by plication of the pubo-vesico-cervical fascia *per vaginam*, followed by abdominal uterine suspen-

sion, shows approximately the return of the base of the bladder to normal level.

The most severe cases of cystocele may be diagnosed at a glance, as in the case of complete procidentia (see Fig. 7), where in addition to herniation of the base of the bladder through the pubo-vesico-cervical fascia there is likewise herniation of the uterus through the main ligaments; with the result that the bladder rides down on the herniated cervix uteri. One of the cases (Fig. 8) illustrates the points. Here there is a tumour mass protruding between the labia with two areas of ulceration on the base, one to the right and the other to the left. Midway between the areas of



FIG. 4



FIG. 6

ulceration there is a triangular depression, the external os uteri. At the upper limit of the tumour is the urethral orifice through which a glass catheter has been inserted, the direction, shown by dotted line, being towards the os uteri. Therefore the entire surface of the tumour is herniated bladder.

A very satisfactory reduction of such an extensive cystocele may be carried out by a Watkin's interposition (Fig. 9), in cases after the menopause, whereby the fundus of the uterus is utilised to splint the base of the bladder. A Watkin's repair was performed on the case illustrated in Fig. 8, with an excellent result, as seen in Fig. 10. The direction of the catheter should be noted in both conditions.

Cystograms of this case are very instructive

Fig. 11 is the pre-operative cystogram and Fig. 12 the post-operative. In the pre-operative condition the bladder is an extra pelvic organ, the fundus of which corresponds in position to the mid point of the symphysis pubis. The bladder as the result of a Watkin's interposition, has been returned to its relative position in the pelvis with its base line slightly below the normal (see Fig. 12).

Here again is the application of the cystogram in the final check of the operative results. It is no longer necessary to await recurrence of symptoms to know that the operation was incorrectly performed.

Cystography in the female may be very easily carried out after careful consideration of a few minor details. The apparatus is simple

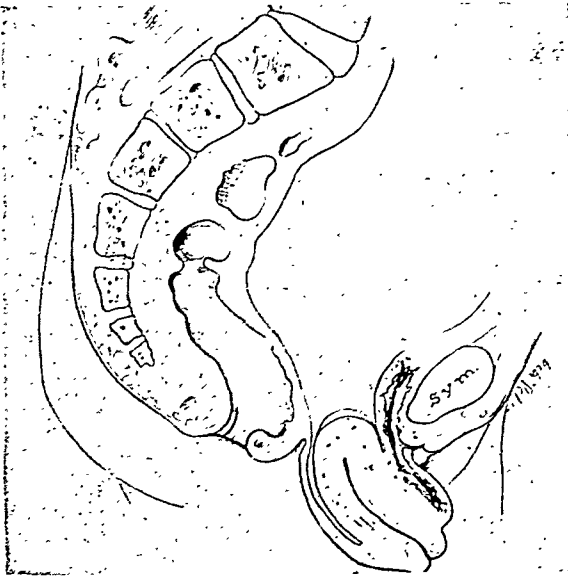


FIG. 7

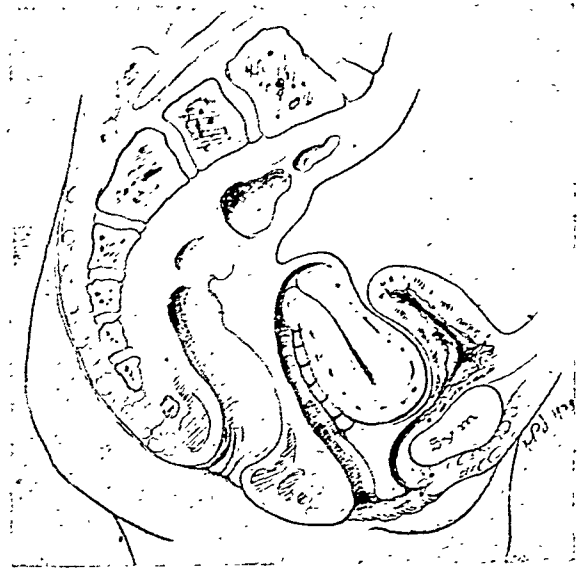


Fig. 9

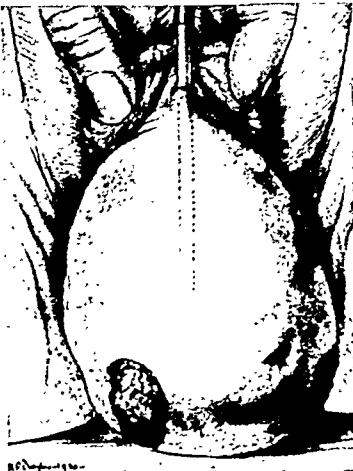


FIG. 8

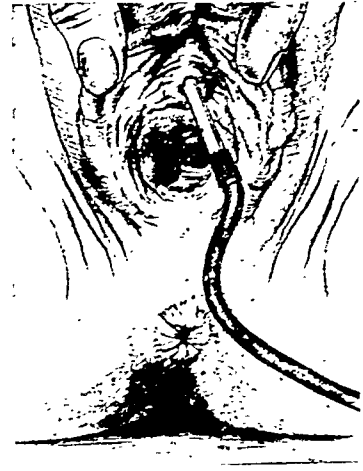


FIG. 10

and not expensive, since practically all hospitals to-day have a well established x-ray department.

The patient for cystography is placed on an ordinary flat table, so that she lies on her back with the knees flexed, the thighs slightly flexed, the knees apart with the heels together. The urethral orifice is then located and the bladder catheterised with a medium sized glass, or preferably rubber, catheter, employing the necessary aseptic technique. When the urine has drained off the catheter is left *in situ*, in order to inject 200 to 300 c.c. of a lukewarm emul-

less. The patient is then allowed to walk over to a vertical x-ray table equipped with a Bucky diaphragm, where she stands with her hands to the side and her back to table, facing the x-ray tube, which is focused on the symphysis pubis at a distance of 30 inches from the Bucky diaphragm. The patient is instructed to hold her breath and at the same time bear down hard, being careful not to move when signalled by the operator, who then with a 100 M.A. tube gives an exposure of 3 to 4 seconds in the case of moderate adiposity; in the case of the obese it is necessary to give 6 seconds' exposure.



FIG. 11

sion of silver iodide into the bladder, by means of a bulb syringe attached to the catheter. The volume injected is gauged by the capacity of the bladder, that is, cease injecting when the patient complains of pressure in the bladder. It is rarely necessary to inject more than 300 c.c. of silver iodide emulsion; furthermore, if the bladder is over-distended the patient will expel the emulsion before reaching the x-ray table. When the desired quantity has been injected into the bladder, pinch the catheter and withdraw it slowly, and at the same time tell the patient to hold her urine. If any of the emulsion should soil the vagina or labia carefully remove it with a piece of gauze, otherwise it will fog the outline of the cystogram. Silver iodide is used on account of its non-irritating effect upon the bladder mucosa. With the exception of the discomfort of ordinary catheterisation the procedure is pain-



FIG. 12

It has been found advisable, if possible, to develop the first plate taken, a matter of about five minutes, before taking a second plate. This frequently obviates the necessity of taking a second plate, or if the first plate is not very sharp it gives the operator some idea of the exposure necessary. When the x-ray work has been completed the patient voids the silver iodide emulsion without any difficulty.

When cystograms are to be used as an operative check great care must be taken with regard to the position of the x-ray tube. It must be placed in exactly the same position for the post-operative cystogram as for the pre-operative cystogram, otherwise the results as interpreted will not be correct. It is advisable to mark the vertical and horizontal readings taken from the x-ray tube supports on the pre-operative cystogram cover.

CONCLUSIONS

The cystogram will give the following aid.

1. It will help in checking up cases with obscure causes of frequency.

2. It will be a guide to the operative results in repair of the traumatized pelvis.

3. Conclusive evidence in diagnosis of a cystocele.

A STUDY OF SEVERAL CASES OF LEUKOSARCOMA AND MYELOSARCOMA

By T. F. NICHOLSON, M.B.,

Department of Pathology, University of Toronto,

Toronto

STERNBERG, in 1903, published a review of the diseases of the blood-forming organs in which he classified the cases with large tumours of lymphoid or myeloid cells, associated with a leukæmic state of the blood, as "leukosarcoma" and "myelosarcoma," separating them from the leukæmias on the one hand, and the lymphosarcomata on the other. Those cases in which there was green colouration of the tumours he designated as "chloroleukosarcoma" and "chloromyelosarcoma."

In the majority of his cases of leukosarcomata there were large mediastinal tumours which had the same gross and microscopic characteristics as the lymphosarcomata of the mediastinum, the only distinguishing feature being the presence of a leukæmia. Thirty-four cases of leukosarcoma have been reported by various authors, and in addition three cases have been seen at autopsy in the Department of Pathology of the University of Toronto. Twenty-nine of these cases had massive mediastinal tumours.

The cases of chloroleukosarcoma, or lymphatic chloroma, usually occur in young children, and are commonly characterized by large orbital and frontal tumours which frequently erode the bone. Records of sixty-two cases of this type were found in the literature, but it is probable that a number of these tumours were of the myeloid variety, as a large number of them were diagnosed before the general use of differential stains.

By far the greater number (sixty-five out of seventy) of the myeloid tumours reported in the literature showed green pigmentation of some of the nodules. They were, therefore, reported as myeloid chloromata, and would be classified by Sternberg as chloroleukosarcoma.

In all these cases, lymphoid and myeloid,

there were definite tumour masses which infiltrated the surrounding structures. The mediastinal tumours were indistinguishable from the mediastinal lymphosarcomata. The skull tumours invaded the bone and sometimes the sinuses. In one case (Lewis) the petrous bone was invaded, and the nerve involvement gave rise to symptoms of mastoid infection. In one of Sternberg's cases the malignant process invaded the eye-ball.

The tumours of these groups, although commonest in the mediastinum and over the skull, occurred in various other locations, and in all of these situations they displayed the quality of invading and destroying the surrounding tissue. MacCallum noted tumours in the ileum, and Sternberg ulcerating masses in the perinæum and in the breast. In Munk's case there were large tumours in the foot and knee. A number of cases with involvement of the ribs and vertebræ have been reported.

Secondary tumours were widespread, the commonest sites being the ribs and vertebræ. In many instances metastatic nodules were found in the liver and kidneys. Secondary deposits were also seen in such unusual places as the brain and testicle. The spleen was enlarged in most cases, but in a few there was little or no change in size. The blood counts of the leucocytes were as high as 810,000, but usually the very high white counts were terminal events, while during the early stages of the disease the range was between 10,000 and 60,000. In four cases (Paltauf, Buschke and Hirschfeld, Weber, Webster), the blood count was normal at the beginning of the disease, although definite evidence of a mediastinal tumour was present in each instance.

The series here reported consists of four

Sternberg's theory of a tumour process, and that these conditions can be best classified as leukosarcoma and myelosarcoma.

SUMMARY AND CONCLUSIONS

1. The gross and microscopic findings in three cases of leukosarcoma and one of myelosarcoma were studied and compared with the reported cases in the literature.

2. From the evidence presented by the observations on these four cases, it seems evident that the disease process (localized lymphoid or myeloid tumours with leukæmic blood) should be considered as a condition separate from the simple leukæmias and of the nature of true tumours.

I wish to express my indebtedness to Professor Oskar Klotz, at whose suggestion this work was undertaken, and who has assisted me with valuable criticism and advice.

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Who first practised percussion in this country (England) I do not know, but it was an Englishman who first noticed Auenbrugger's discovery, which he announced in 1761. Ronald S. Crane has recently brought to light the very interesting fact that Auenbrugger's book was introduced into England by Oliver Goldsmith; who wrote a review of it in the year of its publication—namely, 1761. Being himself a physician this he was qualified to do. Goldsmith gives an admirable abstract of the book, and concludes: "Such are the outlines of

this new discovery; whether it may be of use to society or not there is no necessity for me to pretend to determine; only this may be observed: that the lungs are often, in the most healthy state, found to adhere to the pleura, and in such a case I fancy the sound would, in that part, deceive the practitioner; however, I shall not pretend to set up my conjecture against his experience." The first French notice of it was the publication, in 1770, of a translation by Rozière de la Chassagne.—W. Hale-White.

FRACTURES PERTAINING TO THE MOTOR ACCIDENT

BY G. A. RAMSAY, M.D.,

London, Ont.

THE improved highways of the Provinces tend to become speedways, furnishing a "thrill" for the irresponsible motorist and thus accounting for the majority of accidents. To a lesser extent, the confusion of congested streets contributes, especially to the juvenile casualties. Elsewhere, in construction, transportation and industry, the "safety first" slogan has worked wonders in bringing about the reduction of crippling accidents.

Certain features seem to be common to the fractures produced by motor accidents: they are the effects of direct force; they usually involve the large bones; they are frequently severely comminuted; they are more often compound than those fractures dependent on other etiological circumstances; they are marked by a severity of shock; they are frequently complicated by a severe degree of infection.

Since many of these fractures are compound, and potentially infected, the particular application of the principles of treatment suitable for injury of the soft tissues is essential. The general aim should be to reduce the incidence of infection by the removal of all soiled and completely damaged tissue which would otherwise prove a suitable nidus of bacterial growth. This should be done under full anæsthesia, with preliminary skin sterilization. Hæmostasis is important and there should be as little handling as possible. First, a narrow skin margin is excised, then a wider excision of subcutaneous tissue is done; the frayed and loose tags of muscle are to be removed; when a slow oozing of blood is seen in the muscle wall, this indicates sufficiency. Fascial planes are followed to evacuate blood clot, and the bone is treated. Entirely loose spicules should be removed, and obviously contaminated portions excised by rongeurs. The periosteum is preserved with scrupulous care. If the protruding bone be entirely skinned of periosteum then it is excised up to the line of attachment of the periosteum, and the tube of the latter is tucked down along the axis of the limb.

The reduction of the fracture is usually attained by engaging the fragmented ends by angulation and then straightening them. No metallic fix-

tives are allowed. The wound may be "bipped" and closed, or Dakin's drainage tubes may be placed in position and continued for a few days, and closure then effected. The choice of method is for individual decision. Drains left in for too long act as a foreign body, and when once the mass of blood clot is removed a vaselined gauze pack will suffice. External fixation is best effected by open splinting, and skeletal traction is applied wherever possible.

In a review of the statistics of such accidents, it would appear that certain conditions of fracture recur with sufficient frequency to deduce certain prevailing incidences of casualties to the pedestrian or passenger, or to the anatomical part involved. Thus, ten per cent of the fractures due to motor injury involve the skull and these more often happen to the adult pedestrian, who also shows a liability to fractures of the femur or tibia. On the whole, fractures of the skull are commoner in adults, whilst in children the femur is more frequently broken, though this general rule does not preclude the possibility that either age may exemplify a combination or a reversal of the two probabilities.

Should the adult pedestrian receive a head injury, this may vary from scalp contusions, with slight concussion, to the more grave fracture of the base. Most of these patients are brought to the casualty ward unconscious. The question of immediate importance is the extent to which the intracranial pressure of the cerebro-spinal fluid is disturbed, rather than any immediate assumption of text book analysis as to whether there be concussion, contusion, compression, or laceration of the brain. If we may estimate the intracranial pressure from the degree and combinations of variations in pulse rate, respirations, temperature, pulse pressure, shock, and the psychic state, then we are in a position to decide on procedure in treatment, whether it is to be expectant, or more radical by the operative measures of lumbar puncture or trephining. A further appreciation of the situation requires a recognition of possible complications, such as, scalp contusions or lacerations, skull fractures, depression or penetrations, and finally the major condition of intracranial hæmorrhage.

Case Reports

TRAUMATIC ASPHYXIA*

By H. M. YOUNG, M.D., C.M.,

Iroquois Falls, Ont.

D. W., aged 25, a previously healthy but slight man, was injured on Monday, October 3, 1927, in the paper mill; while engaged in the spreading of felts preparatory to the starting up of the machines. As he was finishing his work on the second press this portion of the machine was accidentally thrown into motion, and in endeavouring to save himself he jumped to seize an overhead bar. This he missed and he fell against one of the larger rolls of the third press. The force of his impact ripped the felt from this roller, which wrapping itself around him pulled him into the machine and between two of the smaller rolls. There he stuck with his head, left arm, part of his chest and abdomen, which had passed between the two rollers, on one side, and the remainder of his body on the other side.

It took about ten minutes to release him by raising the upper roll. At that time he was unconscious, was black in the face, and bleeding from the nose. A very few minutes later he regained consciousness, but was dull and dazed. He did not complain of blindness. First aid was administered, and he was removed to the hospital.

Physical Examination.—By this time he was quite conscious and answered questions readily. A moderate degree of shock was evidenced by the slightly accelerated low tension pulse and vomiting. The vomitus contained fragments of clotted blood mingled with undigested food. He complained of considerable pain all through his body, but more particularly in the region of his left scapula which was fractured. There was a friction burn overlying the left zygomatic arch, but the most striking feature was the dusky cyanotic appearance of his face. In addition, his features were swollen and oedematous, so much so that, although he was well known, it was difficult at first to recognize him.

His eyes were opened with difficulty on account of the swelling and discolouration, but upon examination very marked subconjunctival hæmorrhages, covering practically the whole area of the bulbar conjunctivæ, were evident. The pupils were symmetrical and equal, reacting normally to light and accommodation. There was no retinal hæmorrhage.

On closer examination the dusky cyanosis was seen to be due to a diffuse crop of hæmorrhages into the skin, both discreet and confluent, typical of petechiæ. This condition involved the whole face, scalp, ears, and neck, and extended down over the shoulders and to the left side of the chest in the pectoral region as far as the level of the second costal cartilage. A denser crop of the petechiæ marked very definitely the course of the superficial temporal veins on both sides. Petechiæ were present on the lips and extended well over the buccal mucous membrane. The nasopharynx contained streaks of clotted blood, but no active bleeding was seen. There was no bleeding from the ears, and hearing was normal.

The pulse was quite regular and of fair volume and its rate was 96 per minute. His arterial blood pressure was low, being 110/65.

The respirations were quiet and not unduly accelerated, and his lungs were clear, no râles being present.

The abdomen was retracted and rigid, but moved freely on respiration. There were marks of bruising from the folds of felt. The tenderness which was present over the whole abdomen was quite superficial, and was judged to be due to muscular injury, as there was no other sign present which might indicate intra-abdominal injury. A small friction burn of the third degree was present over the left anterior superior spine.

His legs were uninjured and there were no signs of paralysis.

A lumbar puncture was not done.

Progress.—On the third day he began to expectorate dark reddish black blood. The cough, however, was only slight, even though a considerable number of moist râles had developed throughout his chest. There was no elevation

* Read at the annual meeting of the Ontario Medical Association, Hamilton, May, 1929.

of temperature sufficient to indicate pulmonary infection. The abdominal tenderness was subsiding rapidly.

By the end of a week the petechiæ had almost disappeared, the œdema of his face had disappeared; and there was a large flaky desquamation in progress over the skin of his face and neck. The subconjunctival hæmorrhages were more brilliant than ever. The bloody expectoration was still present although the cough by this time was negligible.

The cough, expectoration, cyanosis were entirely gone by the end of the second week and he was commencing to use his left arm, although the scapular strapping was still in place.

COMMENT

As you will no doubt agree, the typical picture of traumatic asphyxia, as above described, is very striking. The condition was first described following the riots and panics in Paris during the eighteenth century. Numbers may be stricken with this condition in such panics where prolonged compression of the abdomen and thorax is a factor. Robertson, of Toronto, reported a group of cases resulting from a stampede following the cry of "Fire" at a moving picture theatre. Most of the cases reported, however, have been the result of some compressing or slow crushing force. In addition, an interesting case of a patient having two attacks of typical traumatic asphyxia induced by epileptic seizures has been reported by Parker Symes.

Before proceeding with any discussion of the present case it may prove interesting to recall very briefly certain anatomical and physiological factors which seem to have a bearing on this condition. The orifice of the superior vena cava at the right auricle is unprotected by a valve, and likewise the venous radicles which flow into the superior vena cava are in the main devoid of competent valves. Valves of a rudimentary type may, however, be found in such vessels as the external jugular and the superior thyroid veins. This condition, therefore, suggests very strongly that gravity is the main force which ensures the adequate return of the blood to the heart from the upper segment of the body.

In direct contrast, the anatomical findings in the veins below the level of the heart is strik-

ingly apparent, for the veins are richly endowed with valves. Obviously, in man's erect posture, the action of gravity is antagonistic to the normal return of blood to the heart, but nature, in her efforts to overcome this force, provides the veins with a series of step valves; which, together with the pump-like action of the diaphragm, ensure an adequate return of blood to the heart from this larger segment of the body.

When one attempts to analyse the type of violence which produces this condition it is interesting to note that the intensity of the symptoms and signs exhibited seems to have a distinct relation to three main factors: (1) the intensity of the force applied; (2) its duration; (3) the active effort made by the individual to resist the compressing force.

In considering the intensity of the force, the case here reported conveys some interesting information. The rapidity with which the force was applied in this instance is not clear, as the machine was just thrown into motion when the accident happened. A conservative estimate of the speed of the machine at the time would be about 100 feet per minute. The compression to which this man was subjected can, however, be measured more accurately. The clearance of the rolls between which he was drawn, without allowance for felts, is 5.75 inches. Caliper measurements of the patient taken after recovery showed the biparietal diameter of his skull to be 5.71 inches (14.5 c.m.). The diameter from the vertebral spines to the sternum at the level of the second costal cartilage was 6.3 inches, and at the ensiform was 6.3 inches on forced expiration and 7.875 inches on deep inspiration. Allowing for the bulge of the spinal muscles and curves of the ribs posteriorly, the antero-posterior diameter of his chest was compressed by approximately one inch beyond the position of forced expiration and nearly two and one-half inches from the position of deep inspiration. Moreover, the chest was fixed in this position for approximately ten minutes.

Although, a consideration of such a patient's active effort is somewhat speculative, nevertheless some interesting factors seem apparent. Extreme fear and the need for effort at self preservation are at once induced, probably before the actual compression is instituted. For

the brief period before consciousness is lost, violent muscular activity is induced. Respiration receives a powerful stimulus, both emotionally and by the increased CO₂ output resulting from the muscular effort. Because of the extreme degree of fixation of the thoracic wall and the consequent inability of the accessory respiratory muscles to act in the presence of the compressing force the diaphragm alone remains relatively free to carry on respiration, and it is possible that a relative oxygen starvation results. With such powerful sources of respiratory stimulation, it is reasonable to expect that the diaphragm, in response, is thrown into unusually violent and rapid contractions. Its pump-like action on the blood stream would therefore be of some consequence. Moreover, the compression itself would tend to diminish the blood volume in the splanchnic area, apart from a general vaso-constriction which is presumably associated.

Bearing in mind the rapidity with which these opposing forces meet, the particular anatomical structures, and, perhaps, the physics of fluids, it is not impossible to imagine a sudden displacement of blood volume, both mechanical and physiological, to the upper segment of the body faster than the heart can propel it through its proper channels. If this is so, a forceful regurgitation of blood through the superior vena cava would seem inevitable with a sudden rise in venous pressure. The production of such an intense crop of petechial hæmorrhages, strongly suggests such an occurrence. The pathological evidence available demonstrates the formation of petechiæ to be due in some instances to an intense diapedesis and in others to an actual rupture of the vessels. The epistaxis and hæmoptysis which occur are undoubtedly due to the latter. It is interesting to note that a tight collar-band or hat band has in some instances provided sufficient counter-pressure to prevent the formation of petechiæ. This observation probably provides us with a clue to explain the rarity of intracranial hæmorrhage, as shown post mortem and by lumbar puncture. Presumably, the rigid cranium and spinal fluid provide the necessary support to the veins in this locality.

Clinically, the most constant and characteristic features of this condition are the subcon-

junctival hæmorrhages, the periorbital ecchymosis, and the dusky cyanosis or "masque ecchymotique" of the French. Temporary blindness, unconsciousness, epistaxis, and hæmoptysis are usually present in addition. Minute hæmorrhages may occur on the retina and on the tympanic membranes. Intestinal bleeding does not seem to have been encountered in any of the reported cases. The blood pressure is usually slightly low, probably due to the resultant shock. Lumbar puncture demonstrates the absence of blood in the spinal fluid in uncomplicated cases.

The complications are few, bronchitis and broncho-pneumonia being the only ones to be feared. The greatest danger lies in the occurrence of associated injuries. Fracture of the skull, however, is rare, as force is seldom applied to this region. Fractures of the ribs are common, and, when complicated, may prove serious. Intra-abdominal injuries have been known to occur.

The diagnosis should not be difficult. Because of the subconjunctival hæmorrhages, the periorbital ecchymosis, the bleeding from the nose and sometimes the ears, the condition is usually confused with a fracture of the base of the skull. One can however, occasionally save a lot of worry if petechiæ can be demonstrated.

The prognosis in uncomplicated cases is good, both as to life and vision. Optic atrophy has been reported as an unfortunate, but infrequent, sequela. Less severe interference with vision probably does occur, but the lack of accurate knowledge of the prior state of vision in some of the cases at least makes evaluation of the findings difficult. In the case now reported a very moderate hyperopic astigmatism present before the accident remained unaffected at a subsequent examination by his oculist.

The fatal cases reported are usually complicated by severe associated injuries or infection, most frequently pulmonary.

The treatment can be briefly summarized as follows. Efforts must be directed first toward the re-establishment of respiration by stimulants and artificial respiration. Shock must be combated, the lungs protected from infection, and appropriate treatment given for any associated conditions.

A CASE OF SUBACUTE BACTERIAL
ENDOCARDITIS*

By J. P. DAVIES, M.D.

Huntsville, Ont.

Endocarditis, applying the word without any effort at classification, is a condition which we all see very frequently. On questioning a patient or members of the family for the first time, we often feel reasonably certain, in our own minds at least, that we can date the beginning of the endocarditis back to a particular illness. In other cases however the origin may seem more or less vague.

In the case of this patient, whom I wish to present to you, the original illness and subsequent developments or complications followed each other in what one might term an orderly procession. The history of the case is as follows:—

Personal History.—R. D., a girl, eleven years of age, had previously seemed to be about as healthy as the average girl of her age. However, she had had albumin in her urine on several occasions, but it always cleared up and the condition was looked upon as a temporary one. When albuminuria was present there was also œdema in the loose tissues around the eyes. This œdema was at its worst in the morning and improved towards evening. It lasted approximately seven to ten days, and then disappeared completely. Recurrences were about six months to one year apart. She had had all the ordinary children's diseases. The only additional condition that might be deserving of mention was that in September of 1926 she developed a "trench mouth." This involved especially the six front upper teeth, which presented a solid mass of infection. Coincident with this, albuminuria was present, as was also œdema around the eyes.

Family History.—There was nothing worthy of record in regard to past illnesses.

Present Illness.—On July 22, 1928, I visited this patient and elicited the following information, viz., that two days previously she had fallen, causing a very slight abrasion on the right elbow. The abrasion could easily be covered with a small five cent piece, and seemed

to have barely penetrated the outer skin layer. No iodine or antiseptic of any kind had been applied to it. At the time of my visit the patient was in bed with a temperature of 105°, a pulse of 140, and respirations, 40. There was marked infection of the right forearm. The patient said that the area of redness was spreading very rapidly. Under the usual aseptic precautions the area involved was lanced at once, two incisions of approximately three inches in length being made. These incisions did not bleed very freely. Hyperæmia treatment was then employed, the arm being immersed in a hot solution of boracic acid, which was kept at a fairly constant temperature by the frequent addition of hot water. This treatment was kept up day and night. The first temperature taken after lancing showed a fall to 103°, with a corresponding fall of the pulse and respirations. In spite of treatment, however, the area of redness kept spreading around the arm and towards the shoulder, accompanied by a rise of temperature to its former level. Seven incisions, all about three inches in length, were made in thirty-six hours, and still the area of inflammation showed not the slightest sign of abating, with the exception of a fall in temperature following all incisions. At this stage the advisability of amputating the arm at the shoulder joint had to be faced. It looked very much as if this would have to be done in view of the virulence of the infection. Possible life minus one arm, or probable death if amputation was not performed, seemed to be the two choices. Yet one did not wish to be too hasty, and, therefore, although the case was urgent, it was agreed that we would wait for twelve hours longer. I felt that this additional length of time would unquestionably give the patient every possible chance to overcome the infection and thus save her right arm. Within the twelve hours just mentioned the patient apparently seemed to have won the fight. The temperature took a real fall to 100°, with the pulse and respiration following a similar course. The following morning the temperature was only 99.1°. The inflammation by this time had actually started to recede, and things looked brighter. The following day the temperature was subnormal, with the area of redness fading fast, and there was every indication of a successful termina-

* Read at the annual meeting of the Ontario Medical Association, Hamilton, May, 1929.

tion to the illness. Things progressed very nicely during the next ten days. I felt that my services were no longer necessary and the case was turned over to a local Victorian Order nurse, who continued dressing the incisions until they were entirely healed. She also checked up the temperature, pulse, and respirations daily. In a week's time she too left the case, feeling that there was nothing further to be done. Several days later, the nurse was passing this patient's home and by chance decided to look in and see if everything was still satisfactory. The nurse telephoned me on August 19th that our patient seemed to be all right, except that she had a temperature of 99.2° and a pulse of 135. From this date until the present time the temperature has varied from slightly subnormal to 100° , 99.1° or 99.2° being about the average. This temperature of course fluctuated up and down, being lowest in the morning as a general rule. On one occasion the temperature rose to 102° but at this time the patient had a common cold. She took longer than usual to recover, but, once she did, her temperature dropped to its old average of approximately 99.2° .

The pulse is quite regular and usually of good volume but very occasionally becomes thready and rather hard to count. The rate has been extremely variable, ranging from 78 to 160, with an average rate of about 130. In twenty-four hours the pulse rate varies on an average about twenty-five beats. On three occasions the rate dropped from 150 to 85 or 90, but was back well over 100 the next time a count was made. A pulse rate of less than 100 has certainly been the exception to date.

The patient is very well nourished, but is cyanosed at times and has had petechial rashes, as well as some œdema about the eyes. There has been no œdema about the ankles and no dyspnoea. She has a tendency to sigh a good deal, and on taking an unusually deep breath the pulse slows down noticeably for ten to fifteen seconds, but speeds up again immediately. This slowing is undoubtedly due to better aeration for the moment.

The tonsils show no evidence of disease. The teeth are in good condition. The chest is normal. The heart is not enlarged. There is no thrill, but the beat is easily palpable, and the apex beat is easily visible. The heart

seems to be working at top speed continually. No murmur has been heard to date, though on two or three occasions there has been a suspicion of a faint mitral regurgitation, this, however, is very uncertain.

The blood pressure is normal, and has been so all through the illness.

Diagnosis.—There is certainly no doubt that an endocarditis is present. One might question as to what type it belongs to, but it must be either a malignant or ulcerative type, or a subacute bacterial type. In the ulcerative type one would expect to find a fairly well marked murmur in a case which has been active for a period of nine months. This is not the case, however, and this, together with the fact that it seems almost a foregone conclusion that the organism that caused the septicæmia has gained entrance into the general blood stream and produced the present endocarditis, leads me to classify the case as subacute bacterial endocarditis. One might think of rheumatism which plays so prominent a part in cardiac cases, but here we lack any history which is even suggestive. The rapid pulse causes one to be on the lookout for hyperthyroidism, but why the temperature?

CLINICAL LABORATORY REPORTS IN THE CASE OF R.D.

Basal Metabolism Rate: 5 per cent.

Blood Chemistry Report: urea nitrogen, 16.5; creatinine, 2.37; blood sugar, 0.112.

Blood Picture: white blood cells, 9,100 per c.mm.; red blood cells, 5,064,000 per c.mm.; hæmoglobin, 70 per cent; polymorphonuclears, 42; large lymphocytes, 23; eosinophiles, 2; small lymphocytes, 30; mast cells, 2; transitionals, 1.

Blood Culture: negative after 48 hours.

Urine Examination (first specimen): specific gravity, quantity not sufficient; microscopic, many epithelial cells; an occasional leucocyte; reaction, neutral; albumin, very slight trace; sugar, negative; acetone and diacetic acid, negative.

Twenty-four Hour Specimen: specific gravity, quantity not sufficient; microscopic, an occasional red blood cell; a few epithelial cells; reaction, acid; albumin, very slight trace; sugar, negative; acetone and diacetic acid, negative.

Fluid intake: 1750 c.c.

Amount voided: 750 c.c.

X-ray: negative; no cardiac enlargement.

Electrocardiogram: shows nothing unusual.

Prognosis.—The patient does what she is told to do, and in addition she has youth on her side, and these points are in her favour. On the other hand, the dangers which may beset her seem to be very great. The condition has already lasted for a considerable time, and there has been no improvement in the endocarditis to date. There is always the possibility that cardiac decompensation may occur and in that event we should expect a fatal termination. Such a case is also always in the gravest danger from complications. Scarlet fever, measles, etc., might easily be fatal. The prognosis must be very guarded, yet, at the same time, the case does not seem to be hopeless.

Treatment.—General measures hold good here. Rest in bed undoubtedly holds first place and the patient must so remain until the temperature and pulse are normal and the blood free from bacteria. Diet should be light, bland, and easily digestible, and the patient should have good bowel eliminations. It is well to keep a girl of this age occupied and contented if possible.

Seven grains of diuretin were given three times a day, when œdema was present around the eyes, with good results. Tr. digitalis was given rather carefully, in doses of 5 minims three times a day, and this was kept up for one month, but there was no appreciable result. Sodium salicylate was used in doses of 80 grains daily, with 160 grains of sodium bicarbonate. This also had no effect.

Following the apparent failure of digitalis and the salicylates to help, arsenic in the form of Fowler's solution has been used, but has not produced any improvement.

A vaccine was not used because most of the literature on this subject records that vaccines and antisera have as yet shown no definite evidence of their value. With a living organism free in the circulation it is hard to understand how a vaccine could have any possible value.

In conclusion, I might add that although the patient has been in bed for nine months it appears that this is only a beginning for her.

SUCCESSFUL CLOSURE OF SPINAL MENINGOCELE, FOLLOWED BY SEVERE REACTION*

By S. A. WALLACE, M.D., C.M.,
F.R.C.S. (EDIN.),

Kamloops, B.C.

Elizabeth McM. when first seen was five weeks old and in rather an emaciated condition owing to improper feeding. A spinal meningocele was present in the lower sacral region, about the size of a large olive. The opening into the sacral canal admitted the tip of a finger. The sac seemed subcutaneous and was tightly distended when the child cried. Owing to the undernourished condition, it was decided to try to keep the meningocele reduced by a pad and strapping, and to wait until the child put on more weight. At eight months her general condition was fairly good. The meningocele had increased to the size of a walnut, and the covering skin was thin and discoloured. Fearing rupture of the sac, operation was decided upon on May 21, 1929.

Under light ether anaesthesia, with the buttocks raised, a curved transverse incision was made just below the most prominent part of the meningocele and the skin dissected off the sac. When the meningeal sac was opened there was considerable shock and respirations became very shallow and then practically stopped for a few moments. The sac was quickly transfixated and ligated at the base and the lateral edges inverted with overlapping sutures. The skin was closed with dermol and a collodion dressing applied. On returning to the ward, the buttocks were raised, as there had been some loss of spinal fluid during the operation, and a subcutaneous saline and glucose was administered.

The next morning the child was very restless and refused any nourishment. The breathing was rapid and shallow; pulse 160; temperature 105.8°. The anterior fontanelle was bulging and tense. A spinal puncture was performed and a pressure of 22 mg. was found, with turbid fluid which was allowed to drain until the pressure was 6 mg. The cell count was 5440 per c.mm., with polymorphonuclear cells predominating. Cultures of the fluid proved sterile.

* From the practice of Drs. Irving, Wallace and Ireland, Kamloops, B.C.

On May 23rd, using the mother as a donor, a direct transfusion of about 100 c.c. was given, using the syringe method, into the internal saphenous vein at the ankle. The fontanelle was not so distended as the day previous. After the transfusion the child improved and took small amounts of milk.

On May 24th, a slight leakage of spinal fluid was seen at the wound and the buttocks were raised higher. The child was fussy, but taking nourishment better and the general condition was improved.

Improvement was now quite steady. At times the temperature was elevated to 102 and 103 degrees, with occasional leakage at the wound. On June 9th the child was discharged with normal temperature and the wound firmly healed. No bulging was seen at the site of the meningocele when crying or straining.

The interesting features of this case were the post-operative hyperpyrexia and high cell count of sterile spinal fluid.

About the middle of September, nearly four months after the operation, the child was examined and no signs of any bulging could be seen and the opening into the sacral canal seemed firmly covered by dense tissue.

A CASE OF COLLOID CARCINOMA OF THE PERITONEUM*

By F. W. HART, B.A., M.D.,

Indian Head, Sask.

On May 23, 1928, A.B., aet. 59, presented himself for examination. He complained of weakness, indigestion and "gas in the stomach". He said his abdomen had been getting larger during the last two years.

Personal History.—Occupation, farming. He had never used alcohol in any form, and had always had good health except that twenty-five years ago he was in bed for two months with alternating diarrhoea and constipation.

Examination.—He appeared to be younger than his age. His teeth were in bad condition and he had extensive pyorrhea. The respiratory and cardiovascular systems were normal; abdomen was soft and slightly distended. He had double

inguinal herniæ; the left extended to the scrotum and the right just through the ring. The reflexes were normal. Rectal examination, negative.

Laboratory Reports.—Urine: specific gravity 1030, sugar negative, albumin negative; microscopically, large amounts of phosphates. Blood: white blood cells 10,560; red blood cells 2,950,000; Wassermann test, negative.

Roentgenograms of the chest and of the abdomen showed nothing abnormal.

Progress.—The teeth were removed under ether anaesthesia. After this he became weaker and much thinner. The abdomen increased in size. On June 12, sixty-four ounces of straw coloured fluid were aspirated, which was not blood stained. Dr. Frances McGill, Provincial Pathologist, gave this report on the fluid: "Specific gravity, 1015; contains a large amount of albumin; no tuberculosis or other organisms present; contains a few white and a few red cells."

A few days later the left leg began to swell and abdominal distress and nausea became more pronounced. Almost daily he vomited a dark brown fluid having a bad odour. His temperature had been normal throughout; his pulse ranged between 90 and 110. The bowels were loose. He developed a cough with a large amount of greenish expectoration.

He was put in a sun balcony and given iron and arsenic hypodermically. Towards the end of June he began to show some improvement. The vomiting was less, the bowels were more normal, and the appetite improved. At this time the blood showed: white blood cells 3,200; red blood cells 3,930,000. The pulse ranged between 70 and 80. He was eating and sleeping well, and his general condition was much better. Signs of fluid in the abdomen could be elicited. There was slight indication of a mass in the left lower abdomen.

Differential Diagnosis.—Tuberculosis, cirrhosis of the liver, and carcinoma were considered. In favour of tuberculosis was the history of gradual onset, the cough, the presence of fluid in the abdomen, and the apparent improvement in his condition. On the other hand, the age of the patient, the absence of fever and the failure to detect bacilli were against tuberculosis. In favour of cirrhosis of the liver was the ascites. On the other hand the liver was

* Read before a meeting of the Fellows of the American College of Surgeons, on March 12, 1929, at Regina, Saskatchewan.

not diminished and the usual etiological factors were absent. In favour of malignancy was the age, but against it was the absence of early loss of weight and the apparent improvement in his condition.

Toward the end of July, he was admitted to the sanatorium at Fort Qu'Appelle. He was discharged a month later. Dr. C. H. Andrews sent this report: "Physical examination of his chest showed no impairment of resonance or movement and no moisture was heard. The abdomen was distended with fluid and a small hard mass was ballotable just to the left of the umbilicus. The liver could not be palpated and no large glands were felt. Stereograms of the chest showed nothing abnormal, except some haziness of the right base. X-ray of the stomach following a barium meal showed this organ and duodenum to be normal in outline and the stomach appeared to be emptying normally. A barium enema showed marked constriction with smooth borders extending over about three inches along the bowel at the junction of the sigmoid and descending colon. There was another stricture, similar in appearance, about the mid portion of the transverse colon, and a small one in the ascending colon just below the hepatic flexure. They did not appear to be due to spasm and did not alter when manipulated under the fluoroscope.

Injection of the fluid obtained from the abdomen into a guinea-pig gave no evidence of tuberculosis and the intradermal injection of one-tenth of a milligram of tuberculin did not result in any local or constitutional reaction.

The blood urea nitrogen was 20 mgm., and the creatinine was 2 mgm. per 100 c.c., just slightly above the average. The urine contained a trace of albumin on occasions.

Electrographic tracings were normal.

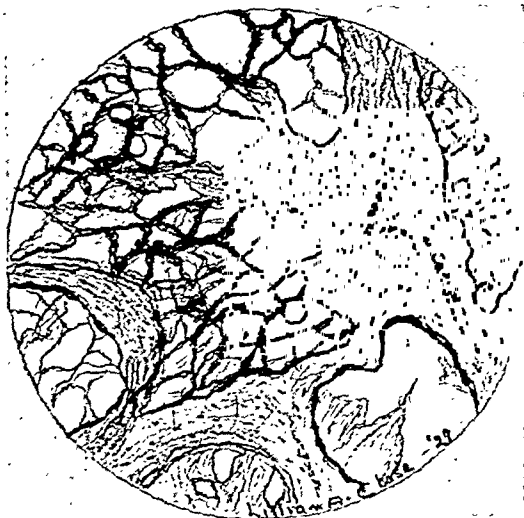
It appears fairly conclusive that the condition is not a tuberculous one. We regret that we were unable to make a definite diagnosis in this case."

He returned from the sanatorium on August 31st, and from that date until his death on January 16th I aspirated about seven quarts of fluid from his abdomen every week. He lived about seven miles out in the country and if for any reason he could not come to my office for a few days over the week he had considerable distress.

The mass in the abdomen became large and was extremely hard to the touch. Masses appeared in the upper left abdomen. He died on January 16, 1929.

Necropsy Report.—On opening the abdomen the hard tumours that was felt proved to be the omentum. It was a very hard, contracted, cartilage-like mass. The suspensory ligament of the liver was also a hard mass. The kidneys were normal. The spleen was contracted. The intestines appeared to be normal. The parietal peritoneum, especially toward the lower part of the abdomen, was covered with thick, soft growths resembling sago pudding (Boyd).

Pathologist's Report (by Dr. Frances McGill)—"Mass from abdomen. This is a colloid cancer. It is a mucoid gelatinous mass which is really not colloid material. In areas it is almost impossible to find any cells as they had been displaced by the mucoid material."



Microscopic appearance of the colloid carcinoma

French¹ states that primary carcinoma of the peritoneum is rare and is usually not associated with ascites. If this case was secondary I cannot tell where the primary growth was. Adami² says that the cells of the adenocarcinoma while retaining the power of forming mucin are unable to excrete it properly, with the result that it becomes heaped up in the cells to such an extent that they become greatly distended and eventually die. Whole alveoli may be composed of more or less inspissated and fused cell-bodies. The growth filled with modified mucin presents a massive translucent appearance. So extreme may be the condition that only here and there

can any alveoli be found showing relatively healthy cells.

Boyd³ states that this so-called colloid degeneration is more apt to occur in cancer of the intestinal tract. Metastases, when they do occur, tend to be of the same nature.

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Retrospect

THE ARTHRITIDES*

BY L. C. MONTGOMERY, M.D.,

Montreal

Owing to the limited time allowed me I shall confine myself to a review of the work that has been done during the past year.

There has undoubtedly been an increase in the interest shown in chronic arthritis during the past year. Some writers feel that it is about to take its place as one of the great chapters of medicine beside tuberculosis and syphilis. A movement looking to its control has been put under way in twenty-four countries, under the title of "La Ligue contre le Rhumatisme." In the United States there is "The American Committee for the Control of Rheumatism." The latter has taken upon itself the preparation of a so-called "Primer," setting forth the salient facts relating to arthritis for lay and medical persons alike, together with some therapeutic principles intended as a guide in treatment. Other steps pending are provision for better instruction in medical schools; extension of information through medical society meetings; inauguration and co-ordination of research; and, finally, some attention to standardization and co-ordination of treatment. It is felt that the magnitude of the problem will preclude dramatic progress, but there can be no reasonable doubt now that the outlook of most of the medical profession towards arthritis will be significantly widened in the not distant future.

Two groupings may be made.

CLASSIFICATION

1. Proliferative type
Atrophic "
Rheumatoid "
Infectious "

These represent an infectious process. The primary change is an inflammatory reaction of the synovial membrane. It is called atrophic because the dominant end-picture is atrophy.

2. Degenerative type
Hypertrophic "
Osteo-arthritic "
Non-infectious "

These represent a non-infectious process. They may be due to senile changes comparable with those of arteriosclerosis and chronic interstitial nephritis. There is primarily a degeneration of joint cartilage. Called hypertrophic because hypertrophy is the dominating end-picture.

Examples of the first general group:

(a) Chronic infectious arthritis referable to foci of infection.

(b) Specific arthritides; here the causative organism is known (tuberculosis, syphilis, surgical joint conditions due to staphylococcus, streptococcus, pneumococcus, meningococcus, etc.).

(c) True arthritis deformans; considered by some to be a chronic progressive polyarthritis of unknown origin but by the majority to represent a severe form of focal infectious arthritis.

Examples of the second general group:

(a) Arthritis of the menopause.

(b) Degenerative monarticular arthritis (morbus coxae senilis).

(c) Senile arthritis.

English writers recognize a third group, "Unclassifiable varieties"; 13 per cent of their cases fall under this heading.

SYMPTOMATOLOGY OF TYPICAL CASES

Proliferative
(Infectious)Degenerative
(Non-Infectious)

- | | |
|--|--|
| 1. Age of onset, 30 to 40 years. | 1. Age of onset, 50 to 60 years. |
| 2. Weight, normal or below normal. | 2. Obesity common. |
| 3. Hæmoglobin percentage is low. | 3. Hæmoglobin percentage is normal. |
| 4. Foci of infection usually present. | 4. Foci usually absent; affection may be endocrine in character. |
| 5. Apt to be migratory. | 5. A localized process. |
| 6. X-ray shows narrowing of the joint space. | 6. X-ray shows lipping and exostosis. |
| 7. There are proliferative changes. | 7. There are degenerative changes. |
| 8. Special sign is fusiform finger joints. | 8. Special sign is Heberden's nodes and grating of joints. |

* Read at the sixtieth Annual Meeting of the Canadian Medical Association, Montreal, June 19, 1929.

It is well recognized that a combination of the two groups may be present in the same person.

STATISTICS

In Berlin disability from arthritis is between three and four times greater than that from tuberculosis. In Sweden arthritic disability stands first on the list of diseases causing permanent pensionable invalidity. Pemberton and Pierce,²⁸ in a study of 1,100 cases, found that: (1) Women predominated in the proportion of two to one. (2) The age of onset was for women, 41 to 50 years; for men, 36 to 40 years. (3) Exposure played somewhat of an etiological rôle among men, as was found during the late war. (4) The joints involved in order of frequency were the knees, hands, spine, shoulder. (5) The sites of focal infections in order of frequency were: dental, 54 per cent; nose and throat, 26 per cent; genito-urinary, 12 per cent; gynæcological, 1 per cent. (6) Heredity played an unexpectedly large rôle. (7) Disturbances of the nervous system were revealed in surprising frequency. (8) The blood pressure tended to be low.

MORPHOLOGY

Nothing of great significance has been decided recently.

PATHOLOGY

Little has been advanced as regards the organic pathology. Two workers have recently found that the histological structure of the fibrous nodules in atrophic arthritis and in endocarditis lenta (subacute bacterial) is apparently the same.

ETIOLOGY

Modern investigation has established the fact that the causes of the rheumatic condition are multiple and their manifestations various. The various theories are as follows:

1. That it is an *allergic* state. The antigens may be: (a) bacterial toxins; (b) the products of bacterial action; (c) incompletely metabolized proteins.

Sensitization to these antigens may be progressive or capable of periodic recrudescence. There is a constriction of blood vessels, due to this sensitized state, which leads to devitalization, damage, and finally destruction of tissues which normally have a poor blood supply, (fibrous, ligamentous and articular structures). Such vaso-constriction has been clearly shown to be an integral part of the rheumatic state, probably caused by exhaustion of the endocrine-sympathetic system invariably associated with allergy.

In addition to this, in some forms of rheumatic disease, substances toxic to the fibrous, ligamentous, and articular tissues may accumulate in them and produce inflammatory changes, resulting in the proliferative type of disease (rheumatoid arthritis).

When destruction results from lack of nutrition, the hypertrophic form of the disease results (osteo-arthritis).

2. *The Infection Theory.*—The infection may be due to various germs: (1) *Streptococcus cardio-arthritis* of Small;³² (2) specific organisms, such as the tubercle bacillus, pneumococcus, etc.; (3) non-specific—most workers believe in the bacterial etiology of many cases of arthritis, but find it increasingly difficult to agree upon any one single organism as the sole or even the chief offender; (4) Zinsser and Swift⁴⁰ think that the supposedly specific rôle of any organism in rheumatic fever is of less importance than a general allergic background, on the basis of which a variety of organisms may, through some common property, produce comparable results.

3. *The Chemical Theory.*—Wells³⁸ states that the actual influence of bacteria in their immunological relations must be sought for in the chemical factors concerned.

4. *The Physiological Theory.*—Whatever the actual etiological factor, the disease itself is caused by a disturbance of the normal functions of the tissues concerned. Pemberton and others²⁷ have found a slight lowering of the basal metabolic rate in arthritics. They attribute this to interference of the blood flow to certain structures, probably, chiefly, the muscles.

A lowered sugar tolerance, or delayed sugar removal, is present potentially in 76 per cent of cases (Cajori, Crouter and Pemberton³). This is attributed to the possibility of the tissues in the arthritic being slightly anæmic, due to a closure of the finer vessels in the capillary beds. The latter condition has been studied by direct observation of the capillaries at the root of the finger nails, and also by contrasting the red blood corpuscles in the first and fourth drop of blood from finger tip. The first drop of blood from arthritics showed a definitely lower count than in the normal. In a study of the effect of systemic heat, exercise and massage, it was felt that the benefit derived was due to the improved blood flow which they bring about.

5. *Endocrine and Metabolic Theory.*—Certain types resemble patients suffering from thyroid disorder and improve with proper treatment. Certain types show achlorhydria (Kilgore¹⁹).

6. *Predisposing Factors.*—The chief that should be mentioned are: climate, sedentary habits, mental and physical strain (Emerson¹¹), an atonic large bowel (Graham and Fletcher¹⁵).

Editorial

I. P. PAVLOV

THE name of I. P. Pavlov is known not only to every scientist but to most educated people. Undoubtedly, he is the greatest physiologist of our time. How much he is esteemed is shown by the fact that on every public appearance during the XIIIth International Physiological Congress he received a great ovation. On September 26th we joined in celebrating his 80th birthday. In spite of his years he is still extraordinarily active in research. At this time it is specially fitting to remember what he has done for physiology in particular and for science in general.

Three fields in physiology, chiefly, engaged Pavlov's attention. In the early days of his career he was interested in the problems of the circulation (regulation of the blood pressure; innervation of the heart.) Later, he devoted himself to the study of the secretion of the digestive glands, and during the last twenty-seven years his whole attention has been devoted to the function of the central nervous system, studied by the method of conditioned reflexes.

Notwithstanding the different territories of physiology in which Pavlov has worked, one and the same idea has guided him throughout all his investigations. The line which he has pursued in his investigations, and to which he gave such great experimental support, may be called "synthetic physiology." (It is said that Professor I. de Burgh Daly of Birmingham proposes to name this tendency in physiology "integral physiology"). If "analytical physiology" has as its aim to decompose a phenomenon into its components and to give them a physical or chemical or a physico-chemical explanation, "synthetic physiology", using similar methods, takes into consideration the whole body, and relates its findings to the organism as a whole. Thus, though there is little difference in the methods of investigation in both cases, the tendency of the investigation, its ultimate aim, is not the same. It was Claude Bernard who

particularly emphasized this integrating tendency. Nobody, however, has contributed so much to its development and experimental foundation as Pavlov. In this respect his work is of quite exceptional importance. It would not be an exaggeration to say that in many physiological laboratories to-day experimentation on animals is replaced by the application of physico-chemical and physical methods of investigation to the analysis of the more basal functions of living cells, tissues, and organs. Important as this is in our science, it should be recognized that the analytical method in itself gives only an incomplete picture of life processes. The latter are usually the resultant of complex interplays of phenomena, and it must not be overlooked that only after the integration of analytical results can the isolated facts give a satisfying conception. A day will come when the most elaborate physical and chemical explanations of separate physiological phenomena will no longer satisfy the investigator. No function of the body is independent of others, and every function is continually changing with the changing conditions of the body. There is also danger of too much of the analytical viewpoint in pathology as well as in physiology. In reality, it is difficult, and perhaps impossible, to draw a line of distinction between these two subjects. As a consequence of this too narrow viewpoint, the art of experimentation, which entails a special, fine technique in vivisection, combined with a highly developed power of exact observation, is disappearing with threatening rapidity from the physiological laboratories. Synthetic physiology alone will help us to understand the correlations of the functions of different organs and will make it possible to build up a conception of the organism as a whole. Besides this, it will form the basis of a true physiological medicine, since medicine has always to deal with the body as a unit.

According to Pavlov, an animal body is

an extremely unstable system, which must constantly maintain its equilibrium with the outer world. To every change in the outer world, whether the most insignificant or one which threatens to destroy the organism, it answers with definite reactions, *i.e.*, with a change, or consecutive changes, in its activities. A constant neutralization of the effects of changes occurring in the outer world, as well as in the inner world of the body itself, is thus accomplished. Therefore, in referring to the physiological, *i.e.*, the normal, function of an organ, we must, strictly speaking, take into consideration the functional state of all the other systems and organs of the body. Incidentally, this conception of a living organism made Pavlov very critical regarding the so-called method of "acute experiment." He always, of course, recognized its great importance for physiology, but he never tired of repeating that the condition of an animal or an organ during such experiments is often far removed from the normal. This incited him, in the case of the digestive glands, to work out a special method for establishing "permanent fistulae" of the gastro-intestinal tract. He organized a special aseptic department in his laboratory for this purpose, and called the method: "the method of physiological surgery." At the present time an aseptic department such as this is a necessary adjunct to every experimental physiological and pathological laboratory.

In a short biographic sketch it is quite impossible to give a review of the scientific achievements of Pavlov and his school. It is enough to say that his studies on the inner-

vation of the heart are of fundamental importance in this branch of physiology. His investigations concerning the activity of the digestive glands, at the end of last century, afforded for the first time in the history of our science a clear and precise picture of the workings of the alimentary tract. As a result of the new operative methods employed in this investigation, and the new ideas on which it was based, this classic work has fertilized research in this branch of physiology all over the world for more than thirty years. Furthermore, Pavlov's data on the function of the digestive glands formed a basis for clinical investigations of the diseases of the alimentary canal.

How far the study of the function of the central nervous system by the method of conditioned reflexes will influence the different domains of knowledge and human relationship cannot yet be fully realized. This is the true physiology of the hemispheres. Descartes' conception of a "reflex" was enlarged and deepened by Pavlov. It was applied to the highest parts of the central nervous system which regulate the finest relations of the animal with the outer world. There is very little doubt that more than one generation of investigators will be occupied in applying, perfecting, and extending the method of conditioned reflexes as a means of studying the function of the central nervous system. Moreover, psychiatry, psychology, sociology, and paedagogy will recognize the new ideas, and in many instances will become adapted to them.

B. P. BABKIN.

DIABETIC COMA AND DIABETIC MORTALITY RATES

IN a recent circular letter¹ issued to physicians by the Department of Health, Massachusetts, attention is called to diabetic coma as a cause of death, and its influence upon the mortality rate from diabetes mellitus. Coma, "always preventable, and nearly always curable," a condition which develops because of "ignorance, negligence or carelessness" on the part of the patient is, in

spite of the advent of insulin, largely responsible for death amongst diabetics. Statistics of the Metropolitan Life Insurance Company are quoted to show that of 1,044 fatal cases of diabetes reported to that company this year to April 15th, coma was responsible for 433 deaths, an incidence of 41 per cent. Failure to lower the death rate from coma is, it is stated, largely responsible for failure to lower the mortality rate from diabetes, and for this the medical profession is to blame. "It is really our own fault"

1. Prevention of Diabetic Death, Department of Public Health, Commonwealth of Massachusetts, June 12, 1929.

preventable and curable condition, the true death rate from diabetes, whatever it may be, could be lowered by the prevention, early recognition, and proper treatment of this complication. This should be generally recognized. There are now available in the literature numerous publications with

details as to the management of this condition with which every physician should be thoroughly familiar. In Dr. Boyd's paper details are given with regard to juvenile diabetes. These apply equally, with very slight modifications, to the adult.

I. M. RABINOWITCH

MALARIAL THERAPY IN GENERAL PARALYSIS

AN interesting report* on general paralysis and the results obtained from its treatment by an induced attack of malaria has just been published as a monograph by the British Board of Control. It opens with a brief historical account of our knowledge of the disease, written by Sir Hubert Bond. In it he gives the credit of publishing, in 1798, the first recognizable description of a case of this disease appearing in the medical literature of the past to Dr. John Haslam, then resident Medical Officer of Bethlem Royal Hospital. In this first description of a case the delusions of grandeur, followed in a short time by symptoms of paralysis and dementia, are unmistakable, and the pathological findings are definite. About this period other cases of paralysis with some enfeeblement of the mind were reported both in England and in France, but the symptoms in each case are described so vaguely and with such lack of detail that no diagnosis is possible. The first recognition of the disease as a distinct clinical entity must be attributed to A. L. J. Bayle, a young student in pathology, aged 23 years, who in his thesis entitled "*Récherches sur les maladies mentales*," presented to the Faculty of Paris for the doctorate of medicine, recorded his opinion that general and more or less complete paralysis associated with mental disorder, when they develop side by side, were due to a chronic arachnitis, and were the associated symptoms of a distinct disease having a definite morbid anatomical picture. This was an opinion never expressed before by anyone, and has since been shown to be true. To him, therefore, was given the credit of the discovery of this severe and important nervous

affection, the centenary of which in 1922 was definitely honoured. During the two closing decades of last century, the connection of this disease with syphilis began to be regarded as almost certain, and was finally confirmed by Sir Frederick Mott in his monumental volume published in 1910 on "*Syphilis of the Nervous System*," and three years later by the discovery of living spirochaetes in the brain by Noguchi and Moore.

The gravity of this affection was recognized from the first, and a diagnosis of its presence in a patient was always regarded as equivalent to a sentence of death within three or four years, as no therapy known until recent years offered any prospect of remission, much less of cure. Since the introduction, however, of its treatment by the induction of an attack of malaria a great improvement in the prognosis has taken place. The discovery of the value of this treatment was not fortuitous. Gerstmann¹ has given us the story of the long series of attempts by Wagner-Jauregg of Vienna to find a non-specific method of treatment, as all forms of specific medication had failed to effect any permanent beneficial results. The first attempt was undertaken in 1888-1889, and consisted in an effort to transmit erysipelas to patients suffering from this disease, but this proved quite useless. In 1890, Wagner-Jauregg began to experiment with bacterial substances using at first Koch's tuberculin, and afterwards the polyvalent typhoid vaccine of Besredka; following these, he tried polyvalent staphylococcus vaccine, and finally the injection of sodium nucleinate; but although some benefit was obtained in some cases, in none were the results satisfactory. Not until the

* General Paralysis and its Treatment by Induced Malaria. Report by Surgeon-Rear-Admiral E. T. Meagher, R.N. H. M. Stationery Office, 1929.

1. Die Malariabehandlung der progressiven Paralyse, by Dr. Joseph Gerstmann, Julius Springer, Vienna, 1925.

summer of 1917 was inoculation with the tertian malaria parasite tested. Of the nine patients on whom the test was made one died in a parietic attack before the treatment had been completed. Of the remaining eight, four achieved a complete remission and were discharged as able to work after six months from the beginning of the treatment. Three of these continue to hold responsible positions. Two cases showed slight improvement; one became melancholic and committed suicide; in the eighth the remission was long delayed, and did not appear for more than a year, but since then has thus far proved to be permanent. Another batch of experiments were made in the winter of 1918, but were a complete failure owing to the fact that the estivo-autumnal strain of parasite was employed instead of the tertian. In September, 1919, the clinic received a pure strain of the tertian parasite, and since then cases have been inoculated without interruption.

In the summer of 1922 this method of treatment was introduced into England by Dr. R. M. Clark, of Whittingham Asylum, with results so satisfactory that the value of the method became generally recognized and adopted in many of the English institutions. Early in 1924 the Board of Control in England issued a circular letter to all institutions under their care directing them to investigate the new remedy. To ensure good results, infected blood was supplied by the Whittingham Asylum to other hospitals, and a special mosquito centre was started at Horton.

To secure the figures for comparison in this monograph a review was made of the fate of 624 general paralytics, who were patients in the asylums in England in 1923, before malarial treatment had become generally employed. Of these patients 560, or 90 per cent, were dead at the end of 1927; 52, or 8 per cent, were still in the hospitals; and 12, or 2 per cent, were living at home. All but two of those still in the hospital were in the last stages of the disease. The 12 living at home were all found to be mentally abnormal; not one was capable of undertaking any ordinary occupation. A similar investigation of the cases admitted into

other hospitals during 1924 showed similar results.

In contrast with the above figures, 286 patients were treated by the induction of a tertian malarial attack in 1924, and an investigation at the end of 1927 showed that of these 286, 120 were dead, 94 were still in the hospital, and 72 had been discharged. Thus 166, or 58 per cent, of the patients were still living. Of the 94 cases still in the hospitals all showed physical improvement, and 34 showed marked mental improvement. Of the 72 discharged, definite information was obtained regarding 67; 39 of these were at work as wage earners, 5 others were temporarily unemployed, 10 were engaged in their ordinary household duties, and 4 others were prevented from working by disability unconnected with the paralysis. Four were undertaking part time work. Similar reports are given of cases treated in 1925, 1926, and 1927, but the time which has elapsed is too brief to make complete reports. Summing up the reports of five years' malarial treatment, the total number of patients treated was 1,597. Of these 34 per cent were dead; 40.8 per cent were still in the hospital, but improved; the remaining 25.2 per cent had been discharged and for the most part were well.

Thus it would appear that malarial treatment definitely increases the length of life, renders existence more natural, and produces improvement in both mental condition and physical state. In many instances complete recovery seems to have been achieved. The opinion is generally held that more might have been accomplished if the cases had been seen earlier. As it is, the treatment certainly offers a great advance in view of the previous hopelessness of the disease.

In Canada the method has been used with much success in many of our hospitals. We publish in this issue a report from the Verdun Protestant Hospital, in which, under careful investigation and supervision of each case, excellent results have been obtained. Special attention is there directed to the value of tryparsamide as an additional remedy following the primary use of the malarial organism.

A. D. B.

THE PRESENT STATUS OF UNDULANT FEVER

IT is becoming more and more evident, as time goes on, that undulant fever is quite widespread, not only in Europe but also in America. In 1907, when Bruce discovered his specific micro-organism, *micrococcus melitensis*, it was thought that cases of undulant fever, or, as it was usually called then, Malta fever, were confined to Malta, the littoral of the Mediterranean Sea, and certain parts of Asia, including the Philippines. Now they are to be found in Canada, Denmark, England, France, Germany, Holland, Italy, Poland, Spain, Sweden, Switzerland, and the United States. The increased recognition of the disease is due to some extent, no doubt, to more accurate methods of diagnosis, and to the fact that public health authorities and veterinarians are now more generally on the alert about it, but competent authorities are of the opinion that this does not explain the great number of cases now being reported, and hold that the disease is actually on the increase. So far as the United States is concerned, Blumer¹ thinks that undulant fever has spread considerably during the last two or three years, and Hardy² states that during 1928 and the first five months of 1929 more than one thousand cases were diagnosed and these were scattered over forty-two states. The disease also has appeared in Canada and reports of cases have appeared in the *Public Health Journal*³ and in our own *Journal*⁴.

It has been known for some years that Bruce's organism is related to the *B. abortus* of Bang, which is the cause of contagious abortion in cattle. In 1918, Alvie Evans⁵ showed that these two organisms are morphologically, culturally, and biochemically indistinguishable, and, moreover, are very closely related serologically. Not long after,

Meyer and Shaw⁶ suggested that a new genus be created, to be known as *Brucella*, in honour of its discoverer. Accordingly, *Micrococcus melitensis* became *Brucella melitensis*, variety *melitensis*, and *Bacillus abortus* became *Brucella melitensis*, variety *abortus*. Then, as it became evident that the *abortus* variety could be found in hogs as well as cattle, the latter form was again subdivided into bovine and porcine strains.

That undulant fever in man is closely related to the contagious abortion of cattle was first advanced by Bevan⁷, of Rhodesia, in 1922, and four years later he was able to report on thirty-five cases in support of his view. Since that date evidence enough has accumulated to convert conviction into certainty. The clinical manifestations of the infections, as they appear in man, are close, practically identical. Even abortion, which is such an outstanding feature in cattle, can occur in the human subject, and, further, may be produced by both forms of infection. Evans, some years ago, proved that *M. melitensis* is competent to produce abortion in cattle as well as Malta fever in man, and, conversely, Kristensen and Holm,⁸ in May of this year, record the cases of three pregnant women suffering from *abortus* fever, who aborted, and in one of these *Br. abortus* was recovered from the placenta.

That undulant fever and *abortus* fever are identical is perhaps still a debatable proposition. We must await more light. Yet, facts like those just mentioned, and others that can be adduced, afford strong support to the argument for the identity of the two affections. Man, goats, cattle, hogs, and, occasionally, sheep and horses, are readily attacked by organisms of the *Brucella* genus, and cattle and hogs, at least, can be reciprocally infected by each other's strains^{9, 10}. The differentiation of the various strains

1. BLUMER, G., *Ann. Int. Med.* 3: 105, Aug. 1929.

2. HARDY, A. V., *J. Am. M. Ass.* 93: 891, Sept. 21, 1929.

3. HARRIS, MCCOY, STEVENS, AND LYMAN, *Pub. Health J.* 19: 272, June 1928. MACLEAN, D. L., MCKINNON, N. E., YOUNG, G. S., JEFFREY, A. M., *ibid.* 19: 274, June 1928. WARNER, W. P., *ibid.* 19: 314, June 1928.

4. HANNAH, J. A., *Canad. M. Ass. J.* 20: 396, April 1929.

5. EVANS, A., *J. Infect. Dis.* 22: 589, June 1918.

6. MEYER, K. F., AND SHAW, E. B., *J. Infect. Dis.* 27: 173, Sept. 1920.

7. BEVAN, L. E., *Trans. Roy. Soc. Trop. Med. & Hyg.* 15: 215, 1922.

8. KRISTENSEN, M., AND HOLM, P., *Centralbl. f. Bakt.* 112: 281, May 28, 1929.

9. HUDDLESON, I. F., *Tr. Am. Pub. Health Ass.*, p. 18.

10. SMITH, T., *J. Exper. Med.* 49: 671, April 1929.

found in the different species of animals by laboratory methods is not always successful. The *melitensis* and *abortus* varieties of *Br.* *melitensis* can usually be separated by agglutination and absorption tests, but it is not possible to differentiate the bovine and porcine types in this way. Here, an important, though, it must be emphasized, an inconstant, feature is that for growth the bovine strain requires an atmosphere with increased carbon dioxide tension, while the *melitensis* and porcine strains are able to grow in an unmodified atmosphere, and, indeed, are somewhat inhibited by carbon dioxide. Possibly, such minor differences are to be interpreted as due to modifications acquired by passage through different species of animals, and, on this assumption, the strains of *Brucella* so far known may very well be scions of one ancestral stock.

The situation in regard to undulant fever is serious, if not alarming. Not only is the disease spreading among human beings, but there is evidence that the same is true of the domestic animals. According to Kern,¹¹ of Philadelphia, in so far as the United States is concerned, 98 per cent of the herds are infected in some regions, and practically no district is free. Unless something more is done, we may expect a greatly increased prevalence of the disease.

It is known that man is frequently infected through drinking raw milk, but there is also much evidence to show that contagion plays an important part. In some agricultural districts males are three times as often infected as are females, and those persons who have the care of cattle or hogs in the fields or barn are particularly liable to contract the disease. In fact, *abortus* fever bids fair to join the ranks of the industrial diseases. Why this should be so will readily be understood when it is pointed out that the specific micro-organism has been isolated from the vaginal discharges of infected cattle, and that, recently, Amoss and Poston¹² have isolated *Br. abortus* from the stools.

So far as man is concerned it is, perhaps, too early to state positively how serious undulant fever may be. It is true that a

fatal issue is uncommon, serious sequels are infrequent, and acute suffering is unusual, but, at least, the disease is apt to be a prolonged one, and we do not as yet know, from a dearth of post-mortem examinations, how serious an effect may be produced upon the internal organs. It is beyond question, however, that the prevalence of the disease, both in man and mammals, is productive of considerable economic loss.

With regard to diagnosis. Any prolonged, remittent, or intermittent, fever should arouse the suspicion of undulant fever. The diseases from which it must be differentiated are typhoid and paratyphoid fevers, infection with *B. Coli*, tuberculosis, malaria, subacute endocarditis, syphilis, and influenza, and, possibly, leukæmia, and pernicious anæmia. An examination of the blood will exclude the last two; a Wassermann test will usually settle the question of syphilis. In most cases the blood shows a leucopenia, with a relative lymphocytosis, which groups the disease with typhoid and paratyphoid fevers, miliary tuberculosis, and influenza. A search for the malarial protozoon will settle the question of malaria. In general, it may be said that undulant, or *abortus*, fever is a fever of many symptoms and few signs. A valuable clinical fact, also, is that the subjective state of the patient is better than his appearance and the elevation of his temperature would suggest. The final diagnosis can usually be made by agglutination tests, by blood cultures, and by identification of the micro-organism by laboratory methods. The examination of all blood sent to laboratories should include the agglutination test for *Br. melitensis* and *Br. abortus* as a routine. Only in this way shall we be able to get any idea of the prevalence of this troublesome infection.

In view of the steadily increasing extension of *brucella* infections, the menace that thereby threatens man, and the importance of the economic problem involved, medical and veterinary practitioners and public health officials should be continually on the lookout for these cases. Not a few points in connection with the epidemiology, pathogeny, and bacteriology remain to be cleared up. Therefore, all cases that are met with should be thoroughly examined and accur-

11. KERN, R. A., *Am. J. Med. Sci.* 176: 405, 1928.

12. AMOSS, H. L., AND POSTON, M. A., *J. Am. M. Ass.* 93: 170, July 20, 1929.

ately reported. Particular efforts should be made, also, to secure post-mortem examinations in the fatal cases, so that the specific

lesions, if any, may be discovered, and our knowledge put upon a more adequate basis.

A. G. N.

ON ATROPINE FEVER

ALMOST every drug in our pharmacopeia has an untoward and dangerous action as well as an action which, properly employed in abnormal conditions of the system, may have a health restoring effect. These untoward actions of drugs should be carefully considered by the physician prescribing the drug, and a strict watch should be kept on their development. It is a definite drawback to the employment of the many new synthetic drugs which at present are offered to physicians with high praise of their asserted valuable therapeutic action that very little is known of the disturbing or even dangerous effects which they may exert on important organs in the body. An example of the untoward effect of one of our well known drugs, not always considered by the prescriber, is given in a short article by Dr. Paul White¹, who calls attention to the rise in temperature and definite leucocytosis which may follow the use of atropine in full doses. White thinks it probable that in

not a few instances in which atropine, or a combination of atropine with morphine, is given to the patient before the administration of an anæsthetic the febrile reaction occasionally noticed afterwards is really due to the atropine. The length of time required for the development of this reaction following the administration of atropine varies. According to Benzing,² the fever usually starts three or four hours after its oral or subcutaneous administration, has its peak in from six to eight hours, and disappears with the rash. The rash itself is regarded by White as a strong vasomotor reaction to counteract the temperature raising action of the drug. While atropine must be regarded as an unusually valuable drug, and also a comparatively safe one, every clinician should realize that in addition to its mydriatic and mouth-parching properties the employment of atropine may give occasion for unexpected irregularity on the temperature charts of patients, especially of youthful ones. A. D. B.

1. *Am. J. Dis. Child.* 37: 745, April 1929.

2. *Monatschr. f. Kinderheilk.* 24: 509, 1923.

Editorial Comments

THE PROFESSIONAL JUBILEE OF DR. MURDOCK CHISHOLM

Fifty years ago Dr. Murdock Chisholm, of Halifax, received his degree in medicine from McGill University. Fifty years is a respectable lifetime; fifty years of professional life is a record that few can boast. We believe we are correct in saying that Dr. Chisholm is the oldest medical graduate of his university in the Maritime provinces. An event of so outstanding a character could not be lightly passed by, and, accordingly, the Halifax Branch of the Nova Scotia Medical Society presented him with an illuminated address and an oil painting of himself, at a banquet held in his honour on October 16th. This tribute was well bestowed, and the *Journal* desires to join its meed of respect and esteem with that of the brethren down by the sea.

Dr. Chisholm's professional career has been

a remarkable, if varied, one. Probably, it is as a surgeon and teacher that he is best known. In both these spheres his achievement has been notable. His first appointment to the Victoria General Hospital in Halifax was as physician; later, he went over to surgery. In the old Halifax Medical College, which eventually became the Medical Faculty of Dalhousie University, he first taught therapeutics, then clinical medicine, and, finally, clinical surgery. He was particularly active, too, in the dark days when it seemed probable that medicine would cease to be taught in Halifax. Faith was weak, except the faith of Dr. Chisholm and a few choice spirits like him. Money was scarce also; but faith, with works, prevailed. Medical education in the Maritimes owes much to Dr. Chisholm, and Dalhousie University recognized this officially when about ten years ago it conferred on him the honorary degree of Doctor of Laws. Other honours have come to

him also. He has been President of the Nova Scotia Medical Society, and was President of the Canadian Medical Association at its historic meeting in 1921. Of Highland descent, Dr. Chisholm is a "bonnie fechter," and many will remember his presidential address on that occasion, when he paid his respects (or otherwise) to the preliminary science subjects of the medical curricula.

Dr. Chisholm is "a lad o' pairts," but he is also modest and must forgive us for drawing attention to some of his special talents. He can sing a gaelic song with the best of them. We beg pardon. Gaelic should be spelled with a capital "G." Unlike some, we will not say many, of our profession, and as becomes a Scotchman, he is a deep student of The Book, and not many years ago he produced a valuable work on Biblical Criticism. Now, we are informed, in view of certain impending developments of Nova Scotian politics, Dr. Chisholm is couching his lance (not his lancet) as a doughty champion on the anti-prohibition side, supporting his position by appropriate quotations from the Scriptures, no doubt not forgetting the first miracle and St. Paul's famous advice to Timothy. But we must desist. Those of us who have enjoyed the advantage of Dr. Chisholm's acquaintance are delighted to bear witness to his good qualities of head and heart, and his friends everywhere will join in wishing him many years still of life and happiness.

A.G.N.

DR. A. S. KENDALL, OF SYDNEY, N.S.

The city of Sydney, N.S., has recently undertaken a large and expensive program of street paving, the cost amounting to more than \$800,000. Our interest in this arises from the fact that the Mayor of Sydney to whom this extensive plan of improvement is due is Dr. A. S. Kendall. Nor is this the only instance of Dr. Kendall's interest in public affairs. During his many years of residence in the city he has always proved himself a leader in all schemes furthering the best interests of the city. He also took a prominent part in opposing what seems to have been an unfair arrangement in remitting taxation in the case of a large industrial concern.

This serving of the public interest has not prevented his carrying on an active professional career. But as a correspondent informs us he "has ever been anxious to do things for the other fellow and has failed to provide well for himself". It is pleasant to learn therefore that the Provincial Legislature has empowered the City of Sydney to provide a small pension for Dr. Kendall for the rest of his life. In granting this power to the City, however, the Government insisted that the item should be included in the

plebiscite already mentioned. There seems to be little doubt that this was one reason why this plebiscite called forth such an unusually wholehearted and enthusiastic support. It was Sydney's way of saying thanks to one who was trusted not only as their mayor but as their medical adviser.

H.E.M.

DR. WILLIAM EWART, F.R.C.P.

Dr. William Ewart, F.R.C.P., consulting physician to St. George's Hospital, died in London on August 11th, after a long period of ill health. His connection with St. George's Hospital had been a long and honourable one; assistant physician for seven years; curator of its museum; lecturer on physiology, and for some time pathologist to the hospital. For many years also he served as assistant physician and pathologist to the Brompton Hospital for Consumption and Diseases of the Chest. In 1882 he delivered the Goulstonian lectures on Pulmonary Cavitation. He contributed the articles on Bronchitis and Bronchiectasis to Allbutt and Rolleston's "System of Medicine," and was the author of numerous communications to the medical press on the climatology of various centres at home and abroad, and of several small brochures which at the time of publication were highly thought of by students generally. Among the more important there were How to Feel the Pulse; Head Studies, chiefly Clinical; and Pulmonary Cavitation. He held the appointment of examiner at the Royal College of Physicians for two separate periods of three years; and later on served as a member of the Council from 1901-1903. His name and his writings will be pleasantly remembered by many of the profession in Canada.

A.D.B.

HEDYOTIS AURICULARIA: A NEW REMEDY FOR COLITIS

An interesting paper on the medicinal properties of a plant not recognized in the Pharmacopœia, *Hedyotis auricularia*, N.O. Rubiaceae, a native of Southern India, which for many years has had a local reputation among the people for the treatment of various forms of diarrhoea, has been forwarded to us by Captain P. R. Bhandarka, L.M. & S., Madras. The green leaves and roots have been used as a decoction by the Captain in cases of colitis with excellent results.

Samples of the plant have been sent to Professor B. B. Dey, of Presidency College, for careful investigation of its active principles, and to several hospitals to test its value clinically. So far, Professor Dey has succeeded in isolating an alkaloid and a possible glucoside. We hope to publish a complete report of the results obtained in the not too distant future.

A.D.B.

Special Articles

ON RAYNAUD'S DISEASE

By A. D. BLACKADER, M.A., M.D., LL.D.,

Montreal

The syndrome to which Maurice Raynaud drew the attention of the profession in 1862 has ever since had a special interest, partly because its exact etiology and pathology remained obscure, and partly because of its being seldom met with. That fingers and toes under the influence of cold may become unduly pale and the tips assume a more or less cyanotic hue is not an uncommon observation. The paroxysmal vascular affection described by Raynaud is, however, a much more serious disorder, and is apparently due to a constricting spasm of the vessels supplying the part, generally one or more digits, producing a definite stoppage of the circulation, and giving rise to what Raynaud termed "local syncope" manifested by extreme pallor; this stage is followed by a period of "local asphyxia" during which the part assumes a more or less deep cyanotic hue which may persist for hours, until relaxation of the spasm takes place and hyperæmia sets in, changing gradually the colour of the part to a pink or brighter red, and restoring to it a normal temperature which during the cyanosis had not risen above the temperature of the surrounding air. This interference with the circulation leads temporarily to more or less abeyance of function in the part, and if prolonged or recurring may lead to loss of vitality with necrosis. Notwithstanding this severe disturbance of the circulation no demonstrable pathological changes in the vessels of the part thus affected have been made out.

In his thesis Raynaud states that his attention was first drawn to the condition by a case of spontaneous gangrene which had come under his notice in 1861, and as the result of personal research through the literature obtainable, he had collected 25 cases in which the vascular supply of the part was affected. Still further, in his later communication of 1874 he associated with this local condition two cases of temporary amblyopia, which he attributed to a tendency to constrictive spasm in the vessels of the fundus oculi. Later observers, including such men as Barlow, Osler, and Munro, have associated this tendency to spasm in the vessels with some lesion in the vasomotor centres or in the nerves, which manifested itself in temporary disturbances of other systems in the body.

Sir Thomas Lewis,¹ writing in the August issue of *Heart*, observes that nothing of definite importance has been added to Raynaud's first description, half a century ago, of the affection, and attributes this failure to advance our knowledge to lack of any experimental investigation of the conditions under which the spasm occurs. Such an investigation he has recently undertaken, and his methods and results appear in a paper which occupies the greater part of the space in that issue. Nine patients out of his numerous clientèle were selected as suitable individuals on which he could carry out his investigations as to how far cold was a factor in the spasm, and to what extent the nervous system was involved. The experiments were made in a cool room in which the temperature registered between 10 and 18 degrees. The bodies of the individuals tested were kept well covered, excepting that one arm was left bare, and lowered temperatures were obtained by immersing the fingers or hands in cold water. If the rooms were over-cooled, or the water in which the hand was placed was too cold a reaction appeared to set in, which prevented the development of the attack. Under the conditions stated a large number of spontaneous attacks were watched from their very beginning; many more were induced at the will of the investigators. The range of temperature over which attacks began or ended appeared to be inconstant and to overlap considerably. On one occasion the fingers of one hand immersed in water at 22 degrees became fully cyanotic with a room temperature of 17 degrees. Recovery took place in the mild cases when the dried hand was laid flat and kept quiet upon a table in a warm room, and relaxation of the spasm was indicated by change of colour and by the fingers becoming warm and remaining so. In more severe cases the change of colour took place gradually, and in some cases intermittently, the latter indicating only partial relaxation of the spasm with a tendency to its return. Sufficient relaxation to produce redness of the skin occurred occasionally at a low temperature, but complete relaxation sufficient to maintain the digits at a normal temperature only took place at a few degrees below normal blood temperature.

All the experiments appeared to indicate that the veins were quite exempt from spasm. Even when the digits were in a cyanosed state there appeared to be free passage from the minute

1. LEWIS, SIR THOMAS, *Heart* 15: 7, 1929.

vessels to the main veins of the arm. The radial pulse could be felt in all the patients during an attack of spasm, even when the whole hand was affected. When the vessels of the digits were apparently in complete spasm, and the circulation apparently at a standstill, the spasm could be relieved and the hand restored to a red colour by immersion in warm water for a variable period. Observations also showed that there was a definite and rather precise relation between the area cooled and the area in which the blood ceased to flow. In the case of cold limited to the fingers the area of discolouration was less than the area of cooling. Cooling the two last phalanges of the fingers led to spasm in the end phalanx only, thus indicating the involvement of the main digital vessels, and not merely the cutaneous arterioles.

While it was evident from the experiments that the spasm could be relieved by warmth locally applied, relief was only obtained when the proximal portion of the vessel in spasm was influenced by the heat. Heat applied at the distal end of the finger did not relieve the spasm if the constriction extended to the root of the digit. Relaxation of the spasm has to begin at the proximal end, and only gradually extends to the distal portion. For this reason in the severer cases complete immersion of the hand effected the most prompt restoration. To sum up, it may be said that all the observations made pointed to a spasm of the digital arteries in their length, and excluded the minute vessels and arterioles.

These observations on the influence of heat and cold in this affection are not compatible with the current view that vascular spasm is a vasomotor phenomenon. We have no evidence to indicate that vasomotor impulses confine themselves to the tips of the digit, nor can we explain with any theory of vasomotor action that vessels in single fingers can be brought into spasm by the application of cold to them. The only conclusion possible from the results of the investigation is that the spasm is due to some hypersensibility in the coats of the affected arteries to relatively low temperatures. It was not necessary to call in the intervention of the central nervous system in any of the investigations made.

A limited number of observations were made with a view of determining whether the superficial vessels were affected as a whole in these patients, or whether the susceptible condition was limited to the supplying arteries. The tests were not extensive, but were sufficient to make it certain that there was no gross general change in the superficial arteries of these patients.

Furthermore, Sir Thomas Lewis investigated

the effect of complete anæsthesia of the ulnar nerve on the circulation of the parts affected by the spasm. The anæsthesia of the nerve failed to produce more than slight relaxation in the flow of blood through the ulnar half of the hand. The temperature of the fingers was not appreciably raised, and cooling of the hand re-induced complete spasm, thus indicating that the vasomotor palsy of the vessels had little effect upon the spasm itself.

Periarterial sympathectomy of the vessels supplying affected parts has also been tried. Adson and Browne² describe an operation on a girl of 16 years, suffering from severe Raynaud's disease of the feet, and believing the disturbance due to an abnormal sensibility of the vasoconstrictor nerves stripped the coats of both common iliac arteries. The operation led to an improved colour in the limb with slightly increased temperature, but gave little relief to the spasm itself.

Summing up the results of his investigations Sir Thomas Lewis calls attention to the fact that the condition which he investigated was only that type of the disease in which the digits, either fingers or toes, became paroxysmally pale and cyanotic, a condition which, if recurring frequently, may result in a limited dry gangrene. Raynaud in his original thesis discussed 25 patients. Of these only 6 would appear to belong to the group in which Sir Thomas Lewis was specially interested. Ten more appear to be in a different group, the etiology of which is still uncertain. For purposes of progressive study, Sir Thomas Lewis considers it essential that Raynaud's group of cases should be subdivided. Careful observation of this smaller group indicates that the immediate cause of the defective circulation is spasm of the digital arteries; vessels of smaller calibre and vessels on the venous side are not involved in the spasm. Local applications of heat and cold show that the spasm is profoundly influenced by the temperature. The abnormal element in the syndrome would appear to be a local and direct reaction to a lowered temperature, due to a peculiar hypersensibility of the vessel wall, and not the result of a reflex through the vasomotor nerve. The pathological element in the vascular spasm is not of central nervous origin as it has generally been thought to be, and there would appear to be no foundation for relating this vascular phenomenon with diseases of the nervous system in other portions of the body. Recent research points to the possibility of it being due to some deficiency of calcium in the blood.

2. ADSON, A. W., AND BROWN, G. E., *J. Am. M. Ass.* 84: 1908, 1925.

THE ART OF STUDY

By A. D. BLACKADER, M.A., M.D., LL.D.,

Montreal

In an address delivered last year at the opening of Guy's Hospital Medical School, Professor R. D. Gillespie,* psychologist to the hospital, referred to study as an art in which his branch of medicine could, perhaps, offer some suggestions that might prove of interest, not only to students, but to all members of that profession whose practice demands almost continuous and lifelong study.

The mental powers involved in the act of studying a subject present several aspects which may perhaps be profitably distinguished. The more important of these are attention, memory, and association.

The Mental Process

Considering the mental process in its entirety, study may be regarded as mental work, for which a mental work curve may be made, showing at first a rise, followed later by a decline in actual accomplishment. Several factors influence the curve. Fatigue is important, but fatigue is a complex affair dependent upon many conditions. Comparatively little of the fatigue appearing in a mental task is definitely mental in origin. Much of what masquerades as mental fatigue arises from interruptions and distractions: and especially is this the case when the task is not interesting, and is of a boring character. An illustration of the comparative indefatigability of mental performance was furnished by the feat of Dr. Arai, quoted by Dr. Gillespie, who multiplied pairs of four place figures continuously for twelve hours without a break. At the end of the twelve hours of continuous multiplication she took rather more than twice as long to perform each complete four figure multiplication as she did at the beginning. Her efficiency was therefore still very high. Furthermore, a normal period of sleep completely restored her capacity, and the work was repeated on four successive days.

Fluctuations occur, however, in the performance of a mental task. Improvement may take place for several successive days, and then a failure to progress may be seen, after which improvement may be resumed. It appears probable that some subconscious re-arrangements have been occurring in the brain, which when they are completed enable further improvement to take place. spurts in which performance is at the highest may occur at the beginning of a task when its novelty stimulates all the mental energy, and sometimes at its close, when the prospect of satisfaction over a completed task may also be accompanied by increased effort.

"Change of work is as good as a holiday" is a proverbial saying and holds true for many kinds of mental work. Subjective fatigue, which is frequently another name for boredom, may be abolished in this way, but a person readily wearied by continuous work of one kind is likely to be similarly affected by continuous work of any kind.

The following deductions are drawn from clinical experience. The mental fatigue of which complaint is frequently made is a matter of comparative unimportance, as only a small proportion of it is properly attributable to fatigue of the brain cells, and this small amount may readily be abolished by a rest pause and normal sleep. The greater part of so-called mental fatigue is made up of boredom, and the impairment of mental performance in such cases is nearly always the result not of intellectual fatigue but of anxiety or worry resulting from some personal problem. For practical purposes the mind is almost tireless. On the other hand, violent physical exercise may disable a person from concentrated mental work for some time afterwards. Even when there is considerable deprivation of sleep intellectual accomplishment may be persistently maintained at a high level, if the worker does not worry about the loss of sleep. To secure the best results mental work should be so arranged that it can be carried on without interruption for several hours at a time, if need be. Rest pauses, which need only be very brief, if well arranged may in many cases tend to increase the total mental output.

On Memory

Turning now to some of the aspects of mental work, memory may be regarded as one of the most important involved in study. There are three distinguishable stages in memory, namely, the impression of an experience on the mind, its retention there, and its recall when wanted. The impression or registration of an experience is dependent on a lively mental attitude. The clearness of our impressions depends largely upon the attention given to the objects producing them. Objects in the focus of attention are more clearly perceived than objects in the fringe, or marginal field, of attention. Although in some cases such objects in the marginal field are more distinctly and firmly impressed than at first seems credible, for ordinary purposes we must rely on focal attention. Ability to give attention persistently seems to be directly proportional to the brain power possessed by the person attending. Instability of attention is a symptom of defective mental power. Lapses of attention, however, occur, usually unnoticed, in normal persons every few seconds. If a watch be placed just within hearing, it will be found to become alternately audible and inaudible. Fatigue and

* Gillespie, R. D., *Brit. M. J.* 2: 365, Sept. 1, 1928.

alcohol increase the depth and duration of these lapses. Any toxæmia and the presence of organic brain disease have a similar effect. "Singlemindedness" is essential for efficient work of any kind, and more especially in mental work.

Another aspect of the memory process is the retention of an impression on the mind, but mere memory, in the sense of psychological retentiveness, is not enough. To have it in a high degree is a great asset, but unless its stores are utilizable in an intelligent way a phenomenal memory is of little help, and may even be a hindrance. Many have questioned whether this power of retention can be improved in any way. Psychologists consider that any improvement can, at the best, be only slight.

Mental freshness, as opposed to staleness, is dependent on several factors. One of these is *retroactive inhibition*. If two tasks are learned in quick succession the acquisition of the second, to some extent, impairs the memory of the first.

Subconscious Elaboration

In the learning of any task a process of subconscious elaboration would appear to take place, and this occurs more readily in intervals of freedom from intensive conscious mental work. This subconscious elaboration is not infrequently evident in our dreams. Unfortunately, the elaboration or actual composition of a subject which takes place in dreams, and may appear to the dreamer in his dreaming hours to be of superior quality will on waking be found for the most part to be commonplace or even meaningless. Instances of a more fruitful kind of subconscious elaboration have been related by men of the rank of genius. It was de Maupassant who said, "*ce n'est pas moi qui pense: ce sont mes idées qui pensent pour moi.*" And Helmholtz said "After the preliminary investigation of a problem happy ideas come unexpectedly without effort like an inspiration; they never come when my mind is fatigued or when I am at my working table; but frequently when on my walks through fields or woods on a bright day." Periods of freedom from conscious mental work may, therefore, be justifiable; many of us have noticed that our best ideas often come while we are engaged in some desultory activity involving no mental effort. The philosopher Hobbes kept a little notebook where at any hour of the day, he would enter the thoughts that darted into the mind from the fringe of consciousness. Graham Wallas recommends any one living a life of intellectual production to do as Darwin did, and keep a folder in which to place stray thoughts which interested him; Osler also speaks of carrying a notebook in which he made jottings while

travelling, or when thoughts occurred to him at odd moments.

As a corollary to the above it may be said that too continuous book reading is not mentally beneficial, for it does not promote habits of reflection and of observation, and leads us to depend on facts and thoughts "spoon-fed" into us. Independent observation, and, wherever it is practicable, definite research to find out for ourselves the secrets of nature, are the best corrective.

Into the acquisition by memory of facts and truths more enters than mere psychological retentiveness. One frequently observes advertisements of methods for improving the memory. Even if it be admitted that innate retentiveness can be increased, which is doubtful, improvement in our powers of memorizing must depend chiefly upon the multiplication of associations. Many of the advertised tonics for invigorating a feeble memory utilize this fact, and ingenious mnemonics and figure alphabets form the most frequently recommended schemes. Such ingenious methods occupy more time than they are usually worth.

Value of Mental Associations

The number of associations that a newly acquired body of knowledge can form in one's mind depends in great measure on the amount and character of previous acquisitions possessed by the student. One of the most important factors in developing a good memory is the multiplication and verification of previous ideas and experiences. To take a very simple example, in preparing for an important examination it is unwise to use only one text-book. While one text-book should be the mainstay, reference to others may present new viewpoints or facts in a somewhat different aspect and in such a way that new associations will be formed for the material gleaned from the staple volume. Still more important is a discussion of the subject in all its bearings with fellow students. "If a man confer little," says Bacon, "he had need have a present wit."

In attempting acquisition of new knowledge certain devices may prove of value. The grouping of the material to be learned into serviceable unities is an advantage. The presence of rhythm makes memorizing easier. To acquire interest in the subject is of importance. We remember best what interests us most; and special interest increases the power of observation as well. It frequently happens that when a name or word which we do not seem to have encountered before, attracts our notice and interests us, it crops up frequently afterwards in our reading. Furthermore, under the influence of interest we select, often without realizing it, items and facts that we remember,

but much should not be left to this more or less instinctive selection.

Too much slavish routine reading, too much ploughing through masses of more or less unnecessary and irrelevant texts, omitting nothing lest anything be missed, the reading of every page of inferior works of fiction produced by a good author is, as we have stated previously, not beneficial. "Some books are to be read only in parts, others to be read but not curiously, and some few to be read wholly with diligence and attention." Closely related with interest is the mental attitude of the student to the subject. Too many sit down to a book or a problem without troubling to form a definite notion of what they expect to get out of it.

The best memory is possessed by the man who makes the greatest number of associations with past work and experience, but the most effective memory is a combination of associations with selection. The man who thinks over his experiences will possess the best memory. This marks the distinction between crammed information and real knowledge of the subject. In cramming one does not think; few associations are formed. Real knowledge involves the organizing of associations, formed under the influence of continued interest and careful selection.

Much better, however, than a slavish devotion to the minutiae of one subject is a study less minute but more comprehensive of several subjects. It has frequently happened that outstanding contributions to one science have been made by men trained in another and who have

in consequence approached the subject from a new and fruitful aspect. Physicists have contributed much to astronomy, chemists to physiology, and mathematicians to many subjects. The absence of a narrow specialism should be one of the glories of medicine.

Associations can be multiplied, not only between cognate fields of knowledge but within each field itself. We have mentioned discussion and debate, and the reading of different books in the same field. There is another most efficacious method and that is to write upon a subject. Writers of monographs not infrequently acknowledge the great benefit which they themselves have received. Writing a coherent and lucid description of a subject is a great advance on any attempt to memorize a text-book account of it. A valuable exercise is the writing of a paper on some piece of original work. The reading of the original articles on a subject is a pleasant and stimulating variant to poring over text-books, and was frequently recommended by Osler to his students. Original work is less cut and dried and dogmatic than text-book essays, and leads to questioning and to an open mind. Finally, method, in the sense of orderliness, is a great asset, not only in the acquirement of learning but in its serviceableness afterwards. The method to be adopted must vary with the individual and with the nature of the subject to be mastered. Some lay stress on regularity of working hours. Certainly, habit facilitates the slow dead heave of the will and overcomes the inertia existing in the most willing people at the beginning of any task.

MOLLUSCUM CONTAGIOSUM IN TURKISH BATHS.—C. G. Crowley, who records three illustrative cases, states that Malcolm Morris, Crocker, and Hutchinson drew attention to the association of Turkish baths and molluscum contagiosum in England. Molluscum contagiosum is very rarely encountered in Australia, so that the incidence of three cases in two days recently seen by Crowley at Melbourne is very unusual. In each case the patient had attended the same Turkish bath a week or so before the eruption appeared. The proprietor of the baths was accordingly warned of the necessity of boiling towels, mats, and similar material, and of treating the slabs with steam and disinfectant. —*M. J. Austral.* p. 806, June 15, 1929.

IMMUNIZATION AGAINST TUBERCULOSIS.—M. Beck has protected guinea-pigs against infection by virulent human tubercle bacilli by repeated inunctions of a tubercle ointment, which was prepared from subcultures of originally highly virulent human tubercle types which had lost the power to cause tuberculosis, yet possessed in high degree an immunizing and healing action on tubercle-affected organs. A series of twenty-three guinea-pigs were inoculated subcutaneously with an emulsion of highly virulent human tubercle bacilli; three of these were regarded as controls. After tuberculosis had been established in all the animals, according to clinical and microscopical evidence, the remain-

ing twenty animals received, during a period of several weeks, six to ten inunctions of the ointment into the previously shaven skin. The guinea-pigs were killed after various intervals of nine days to one month. Tubercle bacilli were detected in three instances, but in the remaining animals, many of which had enlarged glands, tubercle bacilli were not found. The three control animals not treated with inunctions survived a longer period, all being dead after seven months, and all showed presence of tuberculosis in the lungs, liver, and spleen.—*Münch. med. Woch.* p. 1032, June 28, 1929.

AGRANULOCYTOSIS, WITH RECOVERY.—W. B. Blanton states that agranulocytosis is an uncommon condition, although more than fifty cases have been reported since Schultz first described it in 1922. Its principal manifestations are a bleeding ulcer of the mouth with a membrane simulating diphtheria, enlargement of the liver and spleen, occasional swelling of the inguinal lymphatic glands, ecchymosis, and herpes. The blood count shows a marked leucopenia, often less than 1,000 white cells being present. The polymorphonuclears are affected, their number falling to 1 or 2 per cent. More than 90 per cent of the cases were fatal. Blanton records a case, in a man aged 60, in which recovery ensued, although the white cells numbered only 1,000 and the polymorphonuclears were only 4 per cent.—*J. Am. M. Ass.* 93: 2099, June 22, 1929.

Association Notes

OFFICERS OF THE GENERAL COMMITTEE: BRITISH MEDICAL ASSOCIATION MEETING AT WINNIPEG, AUGUST 26-29, 1930

Chairman: - - - - - Dr. W. Harvey Smith
Hon. Secy.: - - - - - Dr. J. D. Adamson
Hon. Treas.: - - - - - Dr. C. A. MacKenzie

Committee on Appointments:

Dr. W. Harvey Smith Dr. J. D. McQueen
 Dr. R. R. Swan Dr. J. D. Adamson
 Dr. Bruce Chown

General Supervisor—Committees: - - - - - Dr. J. C. McQueen
General Supervisor—Sections: - - - - - Dr. O. S. Waugh

GENERAL COMMITTEE:

Representatives at Large:

Dr. G. F. Stephens Dr. D. S. MacKay
 Dr. T. G. Hamilton Dr. A. Gibson
 Dr. W. L. Mann Dr. J. E. Lehmann
 Dr. J. D. McEachern Mr. H. B. Shaw
 Mr. John McEachern Mr. J. L. Hewitt

Special Executive:

Dr. E. S. Moorhead Dr. D. F. McIntyre
 Dr. F. A. Young Dr. Spurgeon Campbell
 Dr. R. D. Fletcher Dr. W. Rogers

Military:

Dr. J. A. Gunn.

COMMITTEE CHAIRMEN AND SECRETARIES

- | | |
|---|---|
| 1. Printing, Publicity and Publishing Committee: | <i>Chairman:</i> Dr. Ross Mitchell
<i>Secretary:</i> Dr. P. G. Bell |
| 2. Entertainment and Dinners Committee: | <i>Chairman:</i> Dr. R. R. Swan
<i>Secretary:</i> Dr. Lennox Arthur |
| 3. Reception Committee: | <i>Chairman:</i> Dr. G. S. Fahrni
<i>Secretary:</i> Dr. Digby Wheeler |
| 4. Finance Committee: | <i>Chairman:</i> Dr. C. A. MacKenzie
<i>Secretary:</i> Dr. Digby Wheeler |
| 5. Transportation Committee: | <i>Chairman:</i> Dr. W. A. Gardner
<i>Secretary:</i> Dr. M. R. MacCharles |
| 6. Hotel, Lodgings and Billeting Committee: | <i>Chairman:</i> Dr. R. W. Kenny
<i>Secretary:</i> Dr. J. S. McInnes |
| 7. Commercial Exhibits Committee: | <i>Chairman:</i> Dr. J. C. McMillan
<i>Secretary:</i> Dr. E. H. Alexander |
| 8. Scientific Exhibits Committee: | <i>Chairman:</i> Dr. J. C. B. Grant
<i>Secretary:</i> Dr. D. Nicholson |
| 9. Entertainment (Ladies) Committee: | <i>Chairman:</i> Mrs. W. Harvey Smith
<i>Secretaries:</i> Mrs. Spurgeon Campbell
Mrs. Digby Wheeler |
| 10. Auditorium Space, Sections and Offices Committee: | <i>Chairman:</i> Dr. E. J. Boardman
<i>Secretary:</i> Dr. C. W. Burns |
| 11. French-Canadian Committee: | <i>Chairman:</i> Dr. R. Michaud
<i>Secretary:</i> Dr. L. D. Collin |
| 12. Religious Service Committee: | <i>Chairman:</i> Dr. H. M. Speechly |
| 13. Laymen's Committee: | <i>Chairman:</i> Mr. H. B. Shaw
<i>Secretary:</i> Mr. G. O'Grady |

SECTIONAL VICE-PRESIDENTS AND SECRETARIES

(A) MEDICINE:	<i>Vice-Pres.:</i> Dr. Chas. Hunter <i>Secretary:</i> Dr. J. M. McEachern
(B) SURGERY:	<i>Vice-Pres.:</i> Dr. B. J. Brandson <i>Secretary:</i> Dr. A. P. MacKinnon
(C) OBSTETRICS AND GYNÆCOLOGY:	<i>Vice-Pres.:</i> Dr. D. S. MacKay <i>Secretary:</i> Dr. F. G. McGuinness
(D) BACTERIOLOGY, PATHOLOGY, PHYSIOLOGY AND BIOCHEMISTRY:	<i>Vice-Pres.:</i> Dr. Wm. Boyd <i>Secretary:</i> Dr. A. T. Cameron
(E) CHILDREN:	<i>Vice-Pres.:</i> Dr. Gordon Chown <i>Secretary:</i> Dr. O. J. Day
(F) MENTAL DISEASES AND NEUROLOGY:	<i>Vice-Pres.:</i> Dr. A. T. Mathers <i>Secretary:</i> Dr. E. C. Barnes
(G) OPHTHALMOLOGY:	<i>Vice-Pres.:</i> Dr. T. H. Bell <i>Secretary:</i> Dr. F. D. McKenty
(H) LARYNGOLOGY AND OTOTOLOGY:	<i>Vice-Pres.:</i> Dr. S. W. Prowse <i>Secretary:</i> Dr. G. W. Fletcher
(I) PREVENTIVE MEDICINE:	<i>Vice-Pres.:</i> Dr. A. J. Douglas <i>Secretary:</i> Dr. T. A. Pincock
(J) TUBERCULOSIS:	<i>Vice-Pres.:</i> Dr. D. A. Stewart <i>Secretary:</i> Dr. B. H. Olson
(K) RADIOLOGY:	<i>Vice-Pres.:</i> Dr. J. C. McMillan <i>Secretary:</i> Dr. Frank Smith
(L) HISTORY OF MEDICINE AND MEDICAL SOCIOLOGY:	<i>Vice-Pres.:</i> Dr. H. M. Speechly <i>Secretary:</i> Dr. J. C. B. Grant
(M) ANÆSTHESIA:	<i>Vice-Pres.:</i> Dr. W. Webster <i>Secretary:</i> Dr. D. C. Aikenhead

NOTE: All Chairmen and Secretaries of Committees, and all Vice-Presidents and Secretaries of Sections are also MEMBERS of the GENERAL COMMITTEE.

THE NEW MOTOR EMBLEM

As has already been noticed in the *Journal*, in accordance with requests from a large number of our members, Council has authorized the issue of a new motor emblem incorporating the familiar green cross which has become so popular in various parts of Canada.

The idea of using the green cross was suggested to the doctors when there was a gasoline shortage during the war. Sunday driving was discouraged and the green cross was then used by many medical men to indicate to the general public that such drivers had a legitimate reason for contravening this unwritten law by appearing on the streets on Sundays and holidays. Since then it has been widely adopted; provincial associations and the Canadian Medical Associations have used it as a windshield sticker at their annual conventions, and the Academy of Medicine, Toronto, has issued the plain cross stamped on aluminum as its official motor badge for several years. The members have found it to be of considerable advantage when they have been required to park in prohibited areas, or to exceed the time or speed limits; moreover, the cross has been found to be of material assistance in soothing the wrath of highway traffic officers.

The plain cross is now being manufactured by several individuals in Canada and the nearby States, and, in order to check this unauthorized

and possibly indiscriminate distribution, the Council decided to create its own design and so have a uniform badge throughout Canada. While this emblem bears the wording, "Canadian Medical Association," its use will be permitted to all licensed practitioners in Canada. It is felt that this evidence of the interest of the Canadian Medical Association in *all* of the doctors of Canada will act as a further incentive to them to join their national association.

These badges are of French bronze with the cross in an attractive green enamel on a light ground. A small caduceus in bronze is superimposed over the upright bar of the cross. Encircling the cross and its lighter ground is a border of dark red enamel through which appears in bronze the words, "Canadian Medical Association." The whole emblem is stamped to a convex contour to augment its appearance. It is perforated above and below, as well as laterally, to permit radiator wiring and has, also, two holes drilled through the border below the cross and at some distance apart to permit its rigid attachment by means of small bolts to the licence plate or to the transverse bar connecting the headlights.

This motor emblem will not supplant the present badge as the official emblem of the Canadian Medical Association, but has been designed to meet the needs of our members who desire a

badge combining both dignity and more ready recognition by traffic supervisors. With this in mind, the cost has been kept low by elimination of expensive detail. By a fortunate purchasing arrangement, these crosses are now available at

one dollar and fifty cents (\$1.50)—cost price—a remarkably low figure for fully enamelled emblems of this quality of workmanship.

Orders can be mailed to 184 College Street, Toronto.

Hospital Service Department Notes

PERTINENT NOTES ON HOSPITAL PLANNING AND CONSTRUCTION*

BY B. EVAN PARRY, M.R.A.I.C.,

Supervising Architect, Department of Pensions and National Health, Ottawa

A picture of the hospital of sixty years ago has been given by Mr. Homer Wickenden, General Director of the United Hospital Fund, New York City. It had no well equipped accident room, no elevators, no electric light—only dim gas light or oil lamps. It had no x-ray department and no trained nurses in trim white uniforms. A patient had none of the advantages of a private room, because there were no private rooms. Whether he wished it or not, he would most likely find himself in an open ward with persons who were suffering from all kinds of diseases. Compare this statement with the estimate given by Dr. S. S. Goldwater, the eminent hospital consultant, wherein that gentleman states that approximately one million dollars per day are being poured into hospital construction at the present time, to provide private, semi-private and ward beds; individual toilets, baths, utility and storage rooms; examining, treatment and consulting rooms; ward laboratories; solaria; rooms for visitors; operating and maternity departments; out-patients' department with clinics; elevators; laundries, public waiting and reception rooms; emergency contagious units; power and heating plants; refrigeration and ventilation; sound deadening construction, and accommodation for nurses.

It is true that the cost of hospitals is an important item in the social budget, but, on the other hand, the public demands so-called necessities to-day which in the past would have been looked upon as luxuries.

It should be realized that hospital planning is a complicated art, that it involves grave social responsibilities and that the proper evaluation of the usefulness of a hospital building can not be made without much study. There is a growing feeling among the members of the medical profession that this phase of

hospitalization should be the subject of study—one might say intensive study—by those associated in human welfare, including members of the medical and nursing professions, sociologists, engineers and architects. Only by such means will the grievous blunders being made every day be averted.

The cost of a hospital is dependent upon three phases, i.e., its mass and arrangement; the quantity and character of its fixed equipment; the materials used in its construction. Therefore, a brief review of some salient features incidental thereto may be found illuminating.

The single room with a floor area of 2,400 square feet would appear to be the most economical plan for taking care of thirty patients. However, since the environmental needs of all patients in a numerous ward group are not constantly the same, and the separation of certain patients from the main group is desirable, modern hospital wards are frequently split into a number of separate rooms, each of which should be directly accessible from a common corridor; but the greater the subdivision of the ward, the greater the area of the interior corridor, every part of which must be added to the minimum ward area of 2,400 square feet. Here is a clear cut case in which the increased cost is accompanied by the parallel increase in ward efficiency, justifying the greater outlay.

Many will appreciate that a considerable portion of the floor area in a hospital is used for purposes other than the immediate care of patients. For instance, the regulation 8 foot corridor, if extended throughout the length of a rectangular building, say, 40 ft. by 200 ft., reduces the floor area by one-fifth of the total, which, together with the whole gamut of service rooms, would consume approximately one-half the total area. Consequently, the danger of referring in terms of measurement based on individual units, when deliberating upon a hospital project, can be appreciated, and a conclusion should only be arrived at after having given very careful consideration to the actual space required for beds, together with the additional space required for corridors, service rooms, etc.

Necessary equipment should be decided by administrative principles and intelligent planning. Balance may be taken as the key-note.

* Written specially for this *Journal*.

No one department should be overloaded at the expense of another; this can be prevented only by the co-operation and loyalty of the staff.

Members of the medical profession, as well as architects, have deplored the unsatisfactory equipment installed in many hospitals: refrigerator plants tucked away in dark corners; unsuitable piping services to plumbing fixtures, the fixtures themselves being pretty to look at, but absolutely worthless as a working commodity; the enormous expense contracted in lighting fixtures and arrangement generally. Why do we persist in fixing ceiling lights in patients' rooms? They should be eliminated and wall lights only installed. Why incur unnecessary expenditure for floor lights? Then, again, the extravagant waste indulged in for the finishings of walls and floors by using unsuitable materials, and, incidentally, destroying in a large measure the efficiency of the services. There is no doubt in the writer's mind that a lot of this waste could be avoided if the administrator of the hospital was a business man, equipped with good common horse sense, and strong enough to override the whims and fancies of his many advisers.

Insulation against climatic conditions and noise has been, and is being, sadly neglected in the construction of hospitals. It would be safe to say that not 5 per cent of the hospitals being constructed to-day are either properly insulated or sound-proof. Take for instance the consumption of fuel. Fifty per cent at least could be saved if proper constructive methods were followed, and, as to noise, certainly one would not hear on every hand the sad plaints of people who have been annoyed during their sojourn in the average hospital. Since measures are at hand whereby these defects can be overcome, surely it behooves all to make themselves acquainted with them.

Truth is dignity, and if this were fully realized, such atrocities as the fancy so-called up-to-date finishings in hospitals would never be tolerated. Fussiness above all things should be deleted, and a quiet restful environment provided.

The finishing of operating rooms has been given close study by outstanding men and it is to be commended that their findings have been followed in some of the newer hospitals of Canada, although, on the other hand, even to-day, white walls in operating rooms, unsuitable flooring, and abominable light and ventilation still obtain, with no justification whatsoever for such blunders.

With the common use of electricity in hospitals, dangers have increased, and one of the most outstanding may be found in the operating

theatre. The danger, from lack of safeguards, caused by combustible anæsthetics, electric cauteries, radio knives, high-frequency machines, and x-ray fluoroscopic equipment is not fully recognized, and, without exception, safe practice dictates the isolation of such equipment in the presence of combustible anæsthetics. The electric cautery, perhaps, presents a difficult problem, as its use is often imperative. However, this hazard might be overcome by resorting to non-combustible and local anæsthetics as far as possible, when the use of the electric cautery is demanded.

It can safely be stated that most of the accidents which have occurred have been caused by static electricity. Therefore, since the hospital operating theatre, of all places, should be such as to afford maximum security and protection, safeguards should be adopted. Each operating theatre should be provided with a system of humidification, the humidity in no case to be less than 60 per cent. Since the proper degree of humidity might vary considerably, it should be determined by actual tests under working conditions. The cylinder or other containers of combustible anæsthetics, mounted on portable trucks, should be so arranged that the complete unit is properly grounded. Door plates at entrances and exits of operating rooms should be thoroughly grounded; likewise any piping system used for conducting a combustible anæsthetizing gas into the operating room.

THE MUSTARD POULTICE A SUGGESTION

A reader has made a suggestion which leads one to believe that he, a surgeon of wide repute, has had the misfortune to be himself a patient and so had the unfortunate but highly valuable opportunity to study the practice of medicine from the viewpoint of the patient.

Despite the antiquity of the remedy, it is true that the vast majority of mustard poultices are still applied in a glacial state and garnished with frost to the most sensitive areas of our bodies. Unlike linseed, such a poultice is thin and quickly loses any initial heat.

It is suggested that more general observation of an improved technique be followed. While the mustard and flour are being mixed, two large plates should be heated either by hot water or by direct heat; the mustard poultice, which is usually covered by a thin layer of cheesecloth, gauze or muslin, should then be turned face downward on one heated plate, covered by the other plate, and so carried as a medium of mercy, not of torture, to the patient's bedside.

Provincial Association Notes

THE MANITOBA MEDICAL ASSOCIATION

"One of the most successful annual meetings of the Manitoba Medical Association ever held" was the verdict passed on the recent gathering in the Royal Alexandra Hotel on September 11, 12, 13, 14. At the same time, and also in this hotel, the annual meetings of the Manitoba Hospital Association and the Manitoba Nurses' Association were held.

The scientific program was chiefly in the hands of the Eastern visitors and their communications were received with great interest. Hon. Dr. E. W. Montgomery spoke on "Maternal mortality", pointing out how Manitoba's position had improved in the last two years. Dr. W. Harvey Smith touched on the preparations for the British Medical Association meeting in Winnipeg in 1930, and Dr. Jas. McKenty presented a clinical analysis of 400 cases of biliary tract disease.

At the luncheon on September 12th, Dr. Boardman delivered the presidential address, taking as his subject, "The municipal doctor". This was an able bit of constructive criticism, and is of such importance that it is hoped to publish it in full shortly. Dr. Boardman made six suggestions, which he amplified upon, as a basis for discussion at the proposed conference. They are as follows:

1. That a minimum salary be set. In the matter of salary, he declared that setting a maximum salary, such as has been done in Saskatchewan, "would be pernicious".

2. That the doctor be free to make the best ethical contract above the minimum for himself that is possible from year to year.

3. That the minimum salary be \$3,000 annually, provided the municipality supply livery both winter and summer; without this that the minimum salary be \$4,000.

4. That the municipal doctor, in every case and under all circumstances, be relieved from the collection of fees.

5. That the contract should provide for a minimum of two weeks' holidays annually, with pay.

6. That a post-graduate course of a minimum of two weeks every four years be imperative, in addition to the two weeks' holiday and also with pay.

Dr. Boardman's suggestions will be handed to the new executive committee of the Medical Association for its consideration.

The luncheon on September 13th was featured with an able address by Dr. T. C. Routley, Secretary of the Canadian Medical Association.

The business meeting was greatly speeded up to the advantage of all by having committee reports printed and available for review previous to the meeting. The election of officers resulted as follows:

President: Dr. Chas. MacKenzie, Winnipeg; *First Vice-president:* Dr. J. S. Poole, Neepawa; *Second Vice-president:* Dr. E. H. Alexander, Winnipeg; *Hon. Secretary:* Dr. F. W. Jackson, Winnipeg; *Hon. Treasurer:* Dr. D. C. Aikenhead, Winnipeg; *Members of Executive:* Dr. S. J. S. Pierce, Brandon; Dr. W. P. McCowan, Winnipeg.

An innovation was provided at the annual dinner in that the ladies met the men at dinner instead of the doctors and their ladies dining separately as in the past. The musical program was provided by two doctors' wives, Mrs. Blakie and Mrs. Etsell, who sang charmingly. Dr. Alex. Swan presided at the piano. Dr. Boardman introduced each of the Eastern visitors to the gathering.

A very pleasing feature of the luncheon on September 13th was the presence of Dr. Kerr, of Washington, D.C., a son of the first Dean of the Manitoba Medical College. In a brief speech Dr. Kerr expressed his pleasure at being present, and spoke feelingly of his father.

The great bulk of the program was presented by the distinguished group of speakers from the East who touched on varied subjects, all of interest to the general practitioner. To these gentlemen: Drs. Murphy and MacKenzie, of Halifax, Dr. A. T. Bazin, of Montreal, Drs. Geo. S. Young, H. B. VanWyck and Gordon E. Richards, of Toronto, the hearty thanks of the Manitoba doctors are due. The films shown were greatly appreciated.

On September 11th, the annual golf tournament was held at the Niakwa course. The M.M.A. cup, won by Dr. W. E. R. Coad, was formally presented to him at the annual dinner by Dr. E. H. Alexander. On Wednesday evening the President, Dr. E. J. Boardman, entertained the members of the Executive Committee at dinner.

THE ALBERTA MEDICAL ASSOCIATION

For the first time in the history of the Alberta Medical Association, this year's gathering was held at Lethbridge, in the far southern part of the province. It proved to be a delightful place in which to have a foregathering of the profession.

This meeting was a memorable one, not only because of the excellence of the program but

also by reason of the splendid efforts and organization by the local executive in the matter of hospitality and entertainment. The welcome addition of the Canadian Medical Association representatives contributed very largely to the success of the meeting. With Dr. A. T. Bazin, President, and Dr. T. C. Routley, Secretary of the Canadian Medical Association, and Dr. G. H. Agnew, of the Department of Hospital Service of the Canadian Medical Association, were Drs. G. H. Murphy, Associate Professor of Surgery in Dalhousie University; K. A. McKenzie, Associate Professor of Medicine, Dalhousie University, Halifax; G. S. Young, late Associate Professor of Medicine, Toronto University; G. E. Richards, Professor of Radiology, Toronto University; and H. V. VanWyck, Senior Demonstrator in Obstetrics and Gynecology, Toronto University.

Dr. P. M. Campbell, of Lethbridge, as President of the Alberta Medical Association ably took charge of the meetings and the various functions. The annual banquet was held at the new Marquis Hotel, at which his Honour Lieutenant-Governor Dr. William Egbert, Dr. A. T. Bazin, Dr. T. C. Routley, and more than one hundred others were present.

The Lieutenant-Governor welcomed the representatives of the Canadian Medical Association from eastern Canada on behalf of the members of the Alberta Medical Association and the medical profession throughout Alberta. He remarked that these visits had proved profitable in the past, since ideas were exchanged, various viewpoints discussed and as a result a bond of friendship was created, all of which bound the profession more securely together. Dr. Egbert referred to the recent death of ex-Lieutenant-Governor Dr. R. G. Brett, and paid him tribute, not only because of his recognized ability in his profession but also because of his services in civic and professional life, which had contributed so much to the growth of this province. A silent tribute was paid to his memory by those present at this banquet. Dr. Egbert urged the members present to take a lesson from the life of Dr. Brett in the matter of rendering public service.

Dr. A. T. Bazin, in his capacity as President of the Canadian Medical Association, brought greetings from our national organization. He remarked that the co-operation of each and every provincial association was a vital necessity to the existence of the Canadian Medical Association. In Alberta, the medical profession was working along the right lines and he mentioned the names of Dr. William Egbert, the present Lieutenant-Governor, and that of the late ex-Lieutenant-Governor, Dr. R. G. Brett. In honouring these men the citizens of Alberta

have shown their faith in the medical profession. Dr. Bazin then brought up the question of state medicine. He referred to the fact that there are groups in every community, to whom medical assistance must be rendered, even though there is no recompense. It was in the matter of treating these so-called "submerged" groups, that the doctor did render service; in fact, hundreds carried out such altruistic services every day and of such beneficent work nothing is ever told. Such a group of patients are unable to pay for adequate medical attention, and physicians are finding it difficult to take care of this class, so large is it becoming, without the aid of some other social organization. It is here that state medicine comes in, and as a service organization the medical profession will have to study the project and will have to determine what other countries that have adopted this plan have found most feasible, and the profession may have to follow the suggestions offered. By this means the public will be served. At the present time *state aid* is furnished to the hospitals, and this could be extended further to *state medicine*, which is the one solution of the problem. It is the big question for the Canadian Medical Association to study at the present time, and already this body has taken steps to accomplish something in this connection. It is necessary that the Alberta Medical Association, as well as our other provincial organizations, get behind the scheme and each contribute towards the support of it, since it is both honest and fair.

Dr. T. C. Routley spoke of the relationship of the Canadian Medical Association to the medical profession at large throughout the Dominion. Physicians carried out their daily work as no other group did, and received little recognition for their services, and moreover were the objects of much complaint by the public. He urged our members to go back to their communities and take their rightful places there. He remarked that it was the duty of every doctor to assume his rightful place in the life of his community, so that in time when confidence grows when the voice of the profession speaks, people will stop to hear it—a recognized force. The time has arrived for the medical profession to stand together, to have a common voice which shall be heard all over the Dominion of Canada. He did not wish the western members to be under the impression that the representatives of the Canadian Medical Association there present brought superior wisdom. They were travelling across the Dominion and coming into closer personal contact with the members of different provincial associations, and in this way, hoped to bring about the consolidation of this great country.

Dr. Routley appealed to all the members of the Alberta Medical Association to join the Canadian Medical Association. He then referred to the meeting of the British Medical Association to be held in conjunction with the Canadian Medical Association in Winnipeg next August. He hoped that the Canadian medical profession would be well represented there.

During the several sessions of the Alberta Medical Association meeting highly instructive lectures were given by the different members of the visiting Canadian Medical Association group.

Dr. G. Harvey Agnew, of the Department of Hospital Service, emphasized the fact, that it has long been a tradition of organized medicine, that the interest of the general public is the interest of the medical profession. It has always been the aim of the members of the medical profession to prove to the public that they are their best friends. The Department of Hospital Service is in constant touch with trustees and governors of hospitals and has been able to see the medical profession from the outside as it were. Hence this department has been functioning as a liaison department. A study has also been in progress of the problem of small hospitals from coast to coast. During the past two years hundreds of requests for advice along these lines have been received and attended to. He urged physicians to organize the staffs of their hospitals, in order to hold frequent meetings and by these means pool their knowledge and experience, and crystallize their opinions in diagnostic and other problems. By getting together a hospital staff can do a great deal to help patients to improve their health. He outlined how these meetings could be made attractive. He urged physicians and hospital boards to get together at a luncheon to be held two or three times a year.

The subjects discussed and those who took part in the program of the meeting were as follows: "The chronic appendix," Prof. G. H. Murphy, Halifax; "The great instruments of precision in the diagnosis of heart diseases, viz., the eyes, the ears and the fingers," Prof. K. A. McKenzie, Halifax; "Electrocardiography," Dr. W. W. Upton, Calgary; "Appendicitis" (unusual types with case records), Dr. L. S. MacKidd, Calgary; "Vomiting of pregnancy," Dr. H. V. VanWyck, Toronto; "Hypertension," Dr. G. S. Young, Toronto; "Recent advances in the use of radium in the treatment of cancer," Prof. G. E. Richards, Toronto; "Body mechanics," Dr. F. Hastings Mewburn, Edmonton; "Potpourri. The pitfalls of practice," Dr. A. T. Bazin, Montreal; "Goitre," Dr. R. W. Lynn, Lethbridge; "Artificial immunity in tuberculosis," Prof. A. D.

Rankin, J. J. Ower, R. M. Shaw, H. M. Vango, Edmonton; "Interesting radiograms," W. H. McGuffin, Calgary; "Treatment of functional nervous diseases" Prof. K. A. McKenzie, Halifax; "Post-operative gastro-jejunal ulcer," Dr. G. E. Learmonth, Calgary; "Fracture of the neck of the femur," Prof. G. H. Murphy, Halifax; "The treatment of nephritis," Dr. G. S. Young, Toronto; "The treatment of eclamptic toxæmias," Dr. H. V. VanWyck, Toronto; "Gastropstosis," Dr. D. S. Macnab, Calgary; "The liver and its ducts in disease," Dr. J. W. Richardson, Calgary; "The x-ray examination of the teeth and sinuses," Prof. G. E. Richards, Toronto; "Dominion medical service," Dr. Ross Miller, Ottawa.

The following officers were elected for 1929-1930:—

Past-President: Dr. P. M. Campbell, Lethbridge.

President: Dr. R. Parsons, Red Deer.

First Vice-president: Dr. T. R. Ross, Drumheller.

Second Vice-president: Dr. H. A. Gibson, Calgary.

Secretary: Dr. W. T. Henry, Fort Saskatchewan.

Treasurer: Dr. N. L. Terwilliger, Edmonton.

Executive Committee: Drs. M. A. R. Young, Lamont; J. E. Lovering, Lethbridge; Walter Park, Calgary.

Representatives on the Canadian Medical Association Council: Drs. L. J. O'Brien, Grande Prairie; H. H. Hepburn, Edmonton; W. A. Lincoln, Calgary; F. H. Sutherland, Peace River; R. W. Lynn, Lethbridge.

Editorial Board for the Canadian Medical Association Journal: Drs. G. E. Learmonth, Calgary (Chairman); H. Orr, and T. H. Whitelaw, Edmonton; H. C. Dixon, Medicine Hat; P. M. Campbell, Lethbridge.

G. E. LEARMONTH

THE BRITISH COLUMBIA MEDICAL ASSOCIATION

The annual meeting of the British Columbia Medical Association was held at the Georgia Hotel, on September 25th and 26th, 1929.

An excellent program on a diversity of subjects was given by the eastern clinicians, whose visit was made possible by the generosity of the Canadian Medical Association.

Dr. Geo. H. Murphy, Associate Professor of Surgery, Dalhousie University, Halifax; Dr. K. A. MacKenzie, Associate Professor of Medicine, of the same university; Dr. Gordon E. Richards, Professor of Radiology, University of Toronto; Dr. H. B. Van Wyck, of the Department of Obstetrics and Gynaecology, University of Toronto; and Dr. George S. Young, Associate

Professor of Medicine at Toronto, were the speakers on clinical subjects. Accompanying these clinicians were Drs. A. T. Bazin, the President of the Canadian Medical Association; T. C. Routley, General Secretary of the Canadian Medical Association; Harvey Agnew, of the Department of Hospital Service; and Ross Millar, of the Department of Health, Ottawa.

Dr. Bazin and Dr. Routley talked on "Medical organization"; Dr. Millar and Dr. Agnew, on their respective departments.

A combined luncheon of the British Columbia and Vancouver Medical Association was held on both days.

A golf tournament, on Thursday, preceded the

annual dinner of the British Columbia Medical Association.

The following officers were elected for the coming year:

President: Dr. W. A. Clark, New Westminster

President-Elect: Dr. G. L. Hodgins, Vancouver

Vice-President: Dr. W. J. Knox, Kelowna

Secretary-Treasurer: Dr. W. T. Ewing, Vancouver.

The wives of the visiting members were entertained by Mrs. Wallace Wilson at the Jericho Golf Club at tea on Wednesday, and by Mrs. G. L. Hodgins at her home on Thursday. A dinner and bridge Thursday evening completed their entertainment.

W. L. GRAHAM

Medical Societies

THE TORONTO ACADEMY OF MEDICINE

The opening meeting of the Academy of Medicine, Toronto, took place on Tuesday, October 1st. As is the custom, the meeting was preceded by the annual dinner, at which the in-coming president, Dr. W. Warner Jones, presided. Amongst the guests of the evening were Sir William Mulock, Sir Robert Falconer, and Dr. McFarlane, who represented the Hamilton Medical Society.

The dinner was well attended. Short addresses were made by Sir William Mulock, Sir Robert Falconer, and Dr. McFarlane. After the dinner, the Fellows gathered for the stated meeting, and listened to the inaugural address of the President, in which he described the growth of the library, and stressed the necessity of the Fellows remembering the ever present need of money for the purchasing of books and periodicals. After the presidential address, Professor D. R. Keys, of the University of Toronto, gave a delightful and humorous talk on, "Reading other than medical," pointing out how necessary it was for the medical man to give some of his time to the cultivation of his imagination.

At the close of the evening a vote of thanks

to Professor Keys was proposed by Professor McMillan and seconded by Dr. J. H. Elliott.

The profession in Toronto and in the province are reminded that on Sunday, October 20th, the sixth annual St. Luke's day service will be held in the chapel of Wycliffe College. The procedure now followed in the holding of St. Luke's day service is that each year in turn the Fellows of the Academy march to some one of the College chapels situated in Queen's Park. All physicians are invited to attend.

The meeting at the Cleveland Academy of Medicine, staged by the Toronto Academy, will take place on November 15th in Cleveland. The Toronto Academy is providing a long and interesting program for the evening, while the hosts at Cleveland are arranging clinics and demonstrations for the following day. This meeting had been planned for an evening in May of this year, but was postponed when the news of the accident at the Crile Clinic was received.

During the month of September the deaths of the following members of the profession were recorded: Dr. J. A. Bedaid, North Bay; Dr. Wm. Douglas, Fort Erie; Dr. Wm. Gilpin, Brechin; Dr. J. M. Kenwood, Toronto; Dr. W. J. Robinson, London.

N. B. GWYN

UNDULANT FEVER.—Walter L. Bierring reviews and analyzes 150 cases of this disease and discusses its clinical history and treatment in detail. An accepted agglutination titre and the demonstration of *Brucella melitensis* variety *abortus* in pure culture in the blood stream should always be required for a positive diagnosis. For the present, symptomatic treatment offers the most for the patient with undulant fever, his activities being regulated by keeping him at rest in bed

as long as the febrile state persists, administering sedatives for insomnia, headache and other distressing symptoms, and, most important, giving an abundant nourishing diet. The convalescence is often prolonged over a long period and careful attention is necessary by means of psychic encouragement, physical therapy and other stimulating measures to insure a complete return to the normal state of health.—*J. Am. M. Ass.* 93: 897, Sept. 21, 1929).

University Notes

University of Toronto

Appointments to and resignations from the staff, session 1929-30:

Professor James M. MacCallum resigned as Professor of Ophthalmology and Head of the Department at the end of last session. He graduated in Arts in 1881 and in Medicine in 1886. He first became a member of the Faculty in 1892, following the late Dr. Thorburn as Professor of Therapeutics. Meanwhile, in 1903, he became Associate Professor of Ophthalmology and Otology. In 1914 he was appointed to the Chair of Ophthalmology, which position he held with distinction until his resignation in 1929.

Professor W. H. Lowry has been appointed Professor of Ophthalmology and Head of the Department. Professor Lowry is a graduate of the University of Toronto of 1901 and has been on the staff since 1912.

Professor D. N. Maclellan resigned from the Department of Ophthalmology in June, 1929. He graduated from Queen's University in 1891. Since 1912 he has been on the staff in Ophthalmology and at the time of his resignation held the appointment of Assistant Professor.

Professor Hardolph Wasteneys has been appointed head of the Department of Biochemistry. Professor Wasteneys has been on the staff since 1918, and takes the place of Dr. Andrew Hunter who resigned at the end of last session to become Professor of Physiological Chemistry at the University of Glasgow, Glasgow, Scotland.

Dr. George S. Young of the Department of Medicine has resigned. Dr. Young is a graduate in Arts and Medicine of this University and has been on the staff in Medicine since 1909. At the time of his retirement he held the rank of Assistant Professor of Medicine and that of Attending Physician in Charge of the Medical Out-Patient Department of the Toronto General Hospital.

Professor George Hunter has resigned to accept the position of Professor of Biochemistry at the University of Alberta. Professor Hunter has been Assistant Professor of Pathological Chemistry at this University since 1925.

Dr. Norman B. Gwyn resigned from the Department of Medicine at the end of the session. He was a Senior Demonstrator in Medicine. He graduated from the University of Toronto in 1896.

Registration for session 1929-30.

	Men	Women	Total
First year	104	6	110
Second year	100	13	113
Third year	114	9	123
Fourth year	132	17	149
Fifth year	126	9	135
Sixth year	93	15	108
Diploma in Public Health	14	..	14
B.Sc. (Med.)	5	..	5
Post-graduate	4	..	4
	692	69	761

Dalhousie University

The medical school of Dalhousie University has opened the new session with an enrolment of more than 160 students. This means that classes are filled to capacity, as it is the policy of the University to limit the size of classes so that there will be no crowding during the clinical years. A very large number of applicants for admission to both the first and advanced years could not be accepted.

Laval University

The number of students registered at the Faculty of Medicine, Laval University, Quebec, is as follows: first year, 52; second year, 55; third year, 52; fourth year, 38; fifth year, 44; a total of 241. No women were registered.

McGill University

The following are the figures for registration in the Faculty of Medicine for the session 1929-30.

	Men	Women	Total
First year	94	3	97
Second year	81	5	86
Third year	92	1	93
Fourth year	98	3	101
Fifth year	85	5	90
	450	17	467

University of Montreal

The following are the figures for enrolment of medical students in this university for the session 1929-1930:

Premedical	56
First year	57
Second year	56
Third year	34
Fourth year	33
Fifth year	42

Total 278

In this number there is one woman student.

latter scheme is to utilise the existent services of the general practitioner and the midwife through an extension of the National Health Insurance, so that a very large proportion of the population of mothers can be attended by a midwife with the services of a doctor guaranteed if and when required. Every pregnant woman will be examined at least once during the pregnancy by the doctor, and he will decide to what extent the midwife can safely undertake the antenatal supervision and conduct the labour in the patient's home. For the success of this scheme the training and education of midwives becomes a matter of great importance, since they will play a most dominating part in the new campaign. The Ministry of Health's committee recommends certain changes in the present methods of training, including an entrance examination, a clinical examination before certification, three months of hospital experience after certification, and post-graduate, or refresher courses, at intervals. With most of the recommendations, including these proposals, there is general agreement, but the suggestion that the Ministry should take over most of the functions of the "Central Midwives Board," the governing body of the profession, is causing great dissatisfaction. Legislation will doubtless be introduced at an early date, and it is hoped that the British Medical Association's very sound scheme will receive the attention it deserves.

The very exceptional summer weather enjoyed throughout the country this year is used by some authorities to point out that if only the beneficial rays of the sun could be continued through the winter months by artificial means much prevention of minor and even major ailments would result. While everyone who has a real interest in health is agreed that the abolition of smoke and the general creation of a healthy atmosphere are certainly to be striven for, there is still acute disagreement about the value of ultra-violet light administered to the child population in bulk at school and municipal clinics. The Medical Research Council's report last March indicated the need for scientific evidence on the value of ultra-violet rays, and the much discussed work of Dr. Dora Colebrook at Willesden is now available for more exact study in a complete report. Briefly, this

worker took a collection of healthy school children and divided them more or less by lot into three groups. One of these groups received ultra-violet rays treatment from naked arc-lamps; a second was exposed in exactly the same way, but with the ultra-violet element of the radiation screened off by window glass; while the third group received no treatment at all. The results were most carefully collected and analysed, and records were kept of the heights and weights, incidence and duration of colds and allied conditions, incidence of infectious fevers, occurrence of chilblains, progress in school work, and causes of absence during the period from August, 1927, to March, 1928. The findings show that there was absolutely no difference in the records for the three groups of children. As the report is careful to point out these negative findings only apply to experiments exactly similar to the present one, but so far there is no corresponding scientific evidence to refute these findings, and it is hoped that some clear thinking on the real value of artificial sunlight will result.

The State and voluntary organizations do a great deal for the blind in this country, but for the deaf the State does practically nothing, and voluntary organizations as much as the meagre support afforded to them allows, although deafness is by far the most widespread sensory disability in this country. It is true that special schools are provided by the State for deaf children, but after this no further interest is shown, while for the blind £600,000 is provided annually from rates and taxes, and the Old Age Pension is allowed at an early age. It is difficult to understand this attitude, and the industrial situation is such that the National Institute for the Deaf is pressing for an adequate and searching inquiry into the present position of affairs. This Institute is doing valuable work under considerable difficulties and it is hoped that its efforts will be rewarded. Blindness has always a very wide appeal to charitable people, but deafness can be an almost equally terrible affliction, and it is surprising that more notice is not taken of this section of our disabled folk.

ALAN MONCRIEFF.

London, 22 Wimpole St., W.1.

DIABETIC GANGRENE OF FACE.—G. Pratt Brooks, M.R.C.S., L.R.C.P., reports a case of diabetes, in which gangrene developed in an unusual site. The condition was resistant to treatment, and ran a fatal course of seven days, mercifully without severe pain. At the time of onset the patient was receiving insulin and dietetic treatment on usual lines. The first thing noted was a hyperæmic area immediately under the right orbit, which spread, similarly to erysipelas, from that

centre; the eyelids swelled up and occluded the eye, which became proptosed with orbital cellulitis. The other eye became similarly affected, while the skin changed to patchy, moist, black sloughs. A photograph, unfortunately, does not clearly show necrosed tissue. Coincident with the local condition, sugar and acetone reappeared in the urine.—*Brit. M. J.* 2: 539, Sept. 21, 1929.

Letters to the Editor

The Fellowship of Medicine and Post-Graduate Medical Association

To the Editor:

We should be grateful if you would insert this letter in your *Journal* for the benefit of medical men and women intending to visit England.

We have heard overseas post-graduates complain that London is so large, and so complicated, that it takes a few weeks to learn the way around; they also say that, unless they come armed with letters of introduction to physicians or surgeons, it is difficult to obtain the facilities they require. The Fellowship of Medicine was founded to overcome these difficulties, and overseas post-graduates should, as a matter of course, come direct to the Fellowship where, without any charge, they can obtain information, advice and assistance.

We can—and every day do—save time for overseas post-graduates who apply to us either before leaving their own country or on arrival in England.

It is frequently mentioned that foreign post-graduate schools are attracting many of our doctors on account of better organization, and we feel sure that this idea is prevalent owing to lack of advertisement of our own activities; hence, we are writing this letter to the Medical Journals in the British Empire. Increased support given to this organization by post-graduates means added facilities for study.

Perhaps the main point to be realized is that in England the Medical Year begins in October, and extends through the winter and spring until the end of July; August and September being the vacation months, opportunities for work are naturally somewhat curtailed, though the Fellowship endeavours to provide facilities for doctors who are only free for study during that time. We would add, however, that for

overseas doctors their arrival in England in August or September means that they will have ample time to settle down and become acquainted with London before starting work in earnest.

We have been told that the information chiefly desired by overseas practitioners is the dates of the various examinations for degrees and diplomas, and the dates, duration and opportunities for securing resident positions in London hospitals, as well as the facilities for special courses of instruction. All this information the Fellowship of Medicine is in a position to provide.

As far as the Fellowship itself is concerned, opportunities for clinical work all the year round are provided in the forty London hospitals with which it is associated, as well as the special courses shown overleaf, and also weekly (free) lectures during the winter months, and weekly (free) clinical demonstrations (except during August and September). In addition, the Fellowship publishes monthly the "Post-Graduate Medical Journal" (6/- per annum post free) containing post-graduate lectures, clinical demonstrations, reports of cases, and information on the various courses of instruction. Above all, however, the Fellowship endeavours to help in every way possible medical practitioners requiring advice and assistance, by acting as a central bureau of information, and, of course, no charge is made for this service.

All enquiries should be addressed to the Secretary, Fellowship of Medicine, 1, Wimpole Street, London, W.1.

Yours faithfully,

H. W. CARSON,

Chairman of Executive Committee.

Sept. 12, 1929.

UNDULANT FEVER.—The characteristics of *Brucella melitensis* organisms have only recently been fully described. A. V. Hardy feels that a classification of strains isolated from human beings cannot now be regarded as a reliable index of the importance of the different varieties as a cause of human disease. A special effort should be made to obtain a detailed post-mortem study in all fatal cases of undulant fever. The pathological lesions and clinical signs of *Brucella melitensis* infections in animals show a definite correlation. The epi-

demiological data, based on the reports of more than a thousand recent cases of undulant fever in the United States, indicate that cattle and hogs with contagious abortion are the source of these infections. Macroscopic agglutination tests on patients with febrile illnesses of undetermined etiology should be made more frequently. Additional study is essential in order to determine effective and applicable methods of control.—*J. Am. M. Ass.* 93: 891, Sept. 21, 1929.

Topics of Current Interest

NEOSALVARSAN AS A PULMONARY ANTISEPTIC

Interest in chronic lung diseases and the applications of surgery to their treatment has been greatly stimulated by Dr. R. A. Young's masterly review of this subject in his Lumleian Lectures delivered in London in March of this year.* Of such conditions there are few that demand greater care and judgment on the part of the physician than that of empyema, particularly when streptococcal in origin, and of chronic bronchiectasis. In the former there is general agreement that too early operation may and in fact usually does lead to that troublesome condition, chronic empyema. This result of treatment by open operation has led many workers to treat such cases by continuous aspiration, with or without irrigation of the cavity with some form of antiseptic solution. That most usually employed has been Dakin's solution—neutral 0.5 per cent solution of sodium hypochlorite—though others have also found their advocates. Recently Dr. Hans Edel† has recorded a few cases which he has treated with intrapleural injection of neosalvarsan. His treatment has been to aspirate the pus through a needle of moderate size, using the same needle to inject at once a solution of neosalvarsan. Edel has found that the pleura is able to withstand large doses of this solution without undue reaction; thus his usual initial dose has been 0.45 g. dissolved in 10 c.cm. distilled water, which is gradually increased up to 0.6 g. according to the general reaction and the degree of refilling of the empyema. The surprising tolerance shown by the pleura to such high dosage suggests to Edel that considerable local thrombosis occurs round the site of the injection. It is, of course, well known that neosalvarsan even in far weaker solutions is a powerful antiseptic, especially against streptococci, and it is natural that the attempt should be made to utilize it at the site of infection instead of in the blood stream alone. Edel has gone further and has injected solutions of similar strength (from 0.15 to 0.6 g. dissolved in 10 c.cm. of water) into the bronchial tree in cases of bronchiectasis. His method has been similar to that used for the introduction of lipiodol into the lung, namely, cocainisation of the trachea and direct injection through a laryngeal catheter. In the few patients he has so far treated Edel reports con-

siderable success, the total quantity of neosalvarsan used being in one case as much as 5.25 g. Another patient suffering from right-sided pulmonary gangrene and empyema received in all 0.9 g. into the pleura and 2.7 g. into the lung, a total of 3.6 g. The patient became afebrile two days after the first injection and in 12 days the empyema had disappeared, "cure" resulting in seven weeks, though the x-ray still showed some thickening of the pleura. The local application of arsenical bactericides in pulmonary conditions is a method to be watched with interest, although clinicians may hesitate to copy the high dosage employed by Dr. Edel until further results have been reported.—*The Lancet*, 2: 32, July 6, 1929.

THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS

The annual report on the museum of the Royal College of Surgeons of England issued by the conservator, Sir Arthur Keith, includes the reports of the curators of the several departments, together with a general survey of the year's work by the conservator. In the latter special mention is made of those who have contributed specimens to the museum during the year, and it is satisfactory to find that so large a number of medical men, not officially connected with the museum, take an interest and pride in it. On the pathological side the curator, Mr. C. F. Beadles, F.R.C.S., reports the addition of over a hundred and fifty new specimens; these, with the additions to other departments, will be on view in Room I of the museum from July 4th to July 27th. Special mention is made by the curator of the numerous additions to the brain and nerve series and to those of the thyroid and pituitary glands. There are also some beautiful preparations illustrating von Recklinghausen's disease, which by themselves are well worth a visit to the museum; and many individual specimens of conditions of which the opportunities for study are infrequent, such as the results of bone grafting for tuberculous disease of the spine, osteoporosis of the skull from diet deficiency, a condition resembling leontiasis of the cranium following injury, and mediastinal teratoma. A comparatively new department is that of palæopathology, dealing with prehistoric diseases. This is a subject in which Sir Arthur Keith takes a special interest; he has already secured the aid of many possible donors in various parts of the country, and in this way has accumulated a nucleus for a section of British palæopathology. A notable contribution to this

* *The Lancet* 1: 593, 697, and 805, 1929.

† Die Lokalbehandlung eitriger Lungenprozesse mit intraborakalen Neosalvarsan-injektionen, *Med. Klin.*, 929, April 26th.

section is due to Dr. Wingrave of Lyme Regis, who has presented a number of specimens of fossil vertebræ of the extinct reptilia; these represent the earliest traces of disease which have so far come under the eye of the geologist. In the department of human osteology Miss Tildesley has made progress in the cataloguing of the collection of human crania. When this work is completed the collection will form a valuable standard of reference in determining the racial affinities of excavated human remains. Many interesting specimens have been added in the physiological department; among these may be mentioned a series of dissections of brains of the higher primates, showing the relative development of the basal ganglia in relation to the expanse of the cortex. From these dissections it appears that in the human brain the basal ganglia have undergone as great a progressive expansion as the cortex. The curator of this department, Mr. R. H. Burne, F.R.S., has continued his investigations on the component of the vascular system of bony fishes, which was discovered by him; and several researches of interest have been carried out by other investigators. Under the care of its honorary curator, Sir Frank Colyer, the odontological section is now one of the most progressive and rapidly expanding parts of the museum; every effort is evidently being made by him to render the collection representative in every detail. In the historical department Mr. C. J. S. Thompson, the honorary curator, is able to report the addition of a large number of surgical instruments, most of them presented by that indefatigable antiquarian, Dr. F. W. Cock—*Brit. M. J.* 1: 1171, June 29, 1929.

THE ENEMIES OF RESEARCH

Most of us are inclined to treat the activities of the antivivisectionist with a certain detachment, for they do not interfere with the work of the ordinary practitioner. The research worker who has suffered directly from these attacks has no such philosophic attitude, and Prof. A. V. Hill seized the opportunity of his Stephen Paget Lecture to the Research Defence Society on June 10th to return a Roland for their Oliver, and to attack the whole spirit which informs opposition to man's painful progress. Too few, he said, realize fully the facts of man's gradual evolution; most people still think that Adam arrived full grown a few thousand years ago, with a complete university education and a degree in zoology. He drew a vivid picture of Nature's age-long experiment in living things by expressing them in the scale of a single lifetime. In that notation it had needed 49 years for man to learn to settle down in villages. Halfway

through his fiftieth year he had learned to write; Christianity had been his religion since the middle of April of that year; printing had been invented a fortnight ago, steam less than a week, cars about a day, and wireless for a few hours. We are yet far from Utopia, said Prof. Hill, but the gradual progress of knowledge has improved men's lot and character and outlook in the last half-million years and may reasonably be expected to continue to improve them in the next 50 million. To the scientist, as to most reasonable men, that heritage of painfully acquired knowledge is a sacred thing. In Prof. Hill's words, "The capacity for knowledge, for understanding himself and his environment, is man's essential characteristic and his alone; to deny him the exercise of this fundamental gift would be an unpardonable, an almost unthinkable offence." To Prof. Hill antivivisection is "only a passing phase in the varying follies of mankind, while the fanatical desire to obstruct the advance of knowledge for one or other cause is a permanent factor in man's mental constitution, a mild form of mental disorder which has expressed itself from time to time in various hideous forms, in cruelty and persecution, in hatred and malice, in the perpetual treachery of hindering mankind in his slow and pathetic efforts to climb the ladder of civilisation. He instanced an "Anti-Rail-Road Journal" published in 1835, supported by the most worthy institutions and claiming to "fight only on the side of truth for the exposure of the railway system." Prof. Hill illustrated his lecture with a selection from a hundred letters he had received from antivivisectionists; most of them were incredible and many unprintable. "I know a gentleman living in Compton-street that has had two of his pussies stolen by your bloodhounds," ran one, and another: "From personal observation I have noticed a vivisector becomes a seducer, an abortionist, and a potential murderer"; while a gentleman in E.12 wrote: "In my particular circle of friends we are doing all in our power to prevent any further subscription being sent to any hospital." On May 24th last the Parish Paper of St. Jude's-on-the-Hill, Hampstead Garden Suburb, contained an appeal from the Rev. B. G. Bouchier to intelligent people to take the opportunity of the general election to put an end to the waste of public money involved in medical research. "When," declared the lecturer, "by telling lies and spreading calumnies, by petty persecution in private or malicious persecution in the police-courts, by attempting to forward legislation forbidding the use of snails, lobsters, and frogs for research the antivivisectionist provides a wanton hindrance to the advance of knowledge, the matter ceases to be a joke, and if he tries to hinder the work of hospitals my blood begins to

boil." He traced the desire to injure or kill those whose opinions differed from one's own through the Old Testament and the Middle Ages, instancing Galileo and other persecuted scientists. The Inquisition, at any rate, he observed, did not commit murder by proxy, but the anti-vaccinationists had declared that the death of Stephen Paget was a direct answer to their prayers. Prof. Hill put forward a vigorous defence of the work of hospitals and research departments and a plea for scientific tolerance combined with continuous scepticism of theory. His concluding words will be echoed by all who believe in evolution. "There are enemies of knowledge in all classes and categories and parties. We should be a great brotherhood unbroken by frontiers and national hatreds. If there is one thing in the world that should be international it is the pursuit of knowledge . . . Individual freedom from molestation is the hard-won basis of modern civilization; so it is with the advance of knowledge. . . . Modesty, friendliness, humanity, and a reasonable sense of humour are the basis of human welfare."—*The Lancet* 1: 1263, June 15, 1929.

BIOPHYSICAL ASSISTANTS

The Society of Apothecaries of London, at the instigation of the British Medical Association, is taking steps to establish a roll of persons of guaranteed training and competency to whom medical men can confidently issue prescriptions for treatment by electricity or irradiation. An approved course of training will be required of all technicians who desire to be placed on the register, and all applicants after May 31, 1930, will be required to pass an examination; the details of the requirements in these respects have not yet been issued. Meanwhile, following the tradition of similar schemes of qualification, technical assistants of approved standing and experience may be admitted to the roll, the main requirement being two or three years' practice in an approved institution. This is by no means an extravagant demand and it may possibly prove to be too lenient. Registered members on the roll will on their side undertake to conform to various professional obligations, the most important being that they will not undertake the treatment of any patient except under the direction and control of a registered medical practitioner. The mechanical and technical apparatus of medicine has become so complicated that there is bound to be a progressive movement in the direction of this scheme for technicians. Clinical laboratories are also catered for by the Pathological and Bacteriological Laboratory Assistants Association which, in collaboration with the Pathological Society, issues certificates

of proficiency to technical assistants who can satisfy stringent requirements of training and knowledge, tested by examination.—*The Lancet* 1: June 1, 1929.

BOOTS AND SHOES

One of the disadvantages of civilization is to be found in the degradation of the human foot which is caused by the use of footgear. Many writers have pointed out the evils wrought by boots and shoes, and by stockings, too, for that matter, and many an essay has been written on the proper form and material of foot covering. The last contribution to the literature of this subject comes from Dr. J. D. Adams,* of Boston, who holds views on the footgear of the child which are sound as far as they go, but hardly seem to go far enough. A study of the history of boots and shoes and of the current practice in shoeing of many peoples all over the world, such as was in part attempted in our columns by Mr. Muirhead Little† in 1914, shows that, with the exception of sandals, all footgear tends to cause abduction of the great toe and gradual loss of the power of voluntary adduction of its phalanges. The Greek or Roman sandal with a thong between the great and second toes did not have this pernicious effect, and the same is true of certain sandals worn in India and elsewhere at the present time. The most primitive form of protection was probably a strip of the skin of an animal or some flexible leaf and the result of winding this or any other bandage round the foot and toes would be abduction of the great toe, involving in time loss of the support afforded by its phalanges. This tendency is evident in Red Indian moccasins, some of which are quite sharply pointed. The early Highland brogue, which was made out of a single thickness of deer's or other hide, had the same defect. The loss of the power of voluntary abduction of the hallux is incurred quickly because of the comparative feebleness of the so-called abductor hallucis and the mechanical disadvantage under which it acts, losing, as it does, all power of adduction after the first phalanx is abducted so that its long axis is a continuation of that of the metatarsal bone. But it is not only the great toe that has suffered from footgear. As soon as man added a stiff sole to the more or less sock-like moccasin or brogue, or made the sandal stiff, the muscles began to atrophy and the complicated musculature of the foot to lose its *raison d'être*. Every normal child appears to be born with active foot muscles and joints, but in every shoe-wearing adolescent the process of degrada-

* *J. Am. M. Ass.* 93: 1753, May 25, 1929.

† Boots and Shoes from Historical and Surgical Points of View, *The Lancet* 1: 1738, 1914.

tion and atrophy is gone through, until the foot becomes no more than a lever hinged at the ankle and jointed at the toes. Dr. Adams figures the radiogram of a "foot in a properly fitted shoe," but even in this a degree of hallux valgus is apparent. Such deformity is, we fear, unavoidable in all boots and shoes, and despite the provision of shoes of which the soles have straight or incurved inner edges, the hallux necessarily pressed upon at the metatarsophalangeal joint declines to avail itself of the space provided. We regretfully conclude that unless digitated stockings and sandals with toe-thongs become our only wear, we must have a more or less abducted great toe. Even the athlete's running shoe is badly shaped. Those that we have seen do not allow for adduction of the hallux and in so much sacrifice the support and propulsive leverage of the great toe.

Men's boots and shoes may be bad, but, if so, what epithet of depreciation is strong enough for the shoes of women? Now that all females are ladies, the workers among them have aped the fashions which were popular with the wealthy idlers of past generations who rode in carriages and did but little walking on their high heels and pointed toes. It is astounding that so few complain out of the millions who now for several years have been defying nature in this way.—*The Lancet* 1: 1 June 15, 1929.

CANADA'S OLDEST DRUG STORE

A drug store with nearly six score years of history is one at the corner of Queen and Grafton Streets in Charlottetown, Prince Edward Island. The building, still called Apothecaries Hall, stands on the site of open where Thomas Desbrisay began business in 1810. He was a son of the celebrated Rev. Theophilus Desbrisay, of whose descendants there are still very many in the province in the gulf.

This curious old announcement was distributed at the time the drug store was opened,

"Thomas Desbrisay, Junior,

Informs the public that he has opened
an Apothecary's Shop

In Charlottetown and intends to supply the medical wants of the inhabitants in general, where he offers for sale a variety of genuine drugs and medicines.

"He is sorry that from various and unexpected disappointments his supplies have not been so extensive as he had expected and that for the present the sale of some articles is unavoidably limited to smaller quantities than he intended. However, as he intends to conduct his establishment in future on a more general plan he will take care regularly to be sufficiently pro-

vided with everything required in his line of business.

"Families in the country remote from medical assistance may be supplied with medicines together with written directions as to their uses and applications.

N.B.—Prescriptions made up with accuracy and despatch. Cow pox inoculation.

"Heads of families for their children, and all others desirous of availing themselves of the benefit of the Cow Pox inoculations are informed that the subscriber has lately received a supply of genuine matter.

Thomas Desbrisay, Junior.

N.B.—The poor will be inoculated free of expense.

Dec. 24, 1810."

The old advertisement unwittingly gives us a glimpse into the early colonial life of Prince Edward Island and the last little postscript gives a key to the interest in the "cow pox" situation at the time and a pioneer effort at prevention of disease among the unfortunately poor.—Blodwen Davies in *Saturday Night*, Toronto, Aug. 17, 1929.

HINTS TO WRITERS

Lt.-Col. J. H. Woods, editor of the *Calgary Daily Herald*, has prepared a very complete and useful "Style Book" for the guidance of his staff of writers.

Col. Woods is one of the leading newspaper men in Canada. He has been the head of the Press organizations in Canada, and is now Chairman of the Canadian section of the Empire Press Union. He has taken a leading part in all Imperial Press Conferences.

Col. Woods produced his "Style Book" at a recent conference of newspaper men at Toronto. "We have all been talking about it, but you have done it," they told him. Col. Woods observed that he did not know that such a guide to newspaper English and directions to the staff existed in any newspaper office in Canada or the United States.

Primarily intended for reporters and other writers for the newspaper, of course, a few points in the "Style Book" strike the eye of such a character as to be valuable not only to newspaper men but to all who indulge in literary composition, whether scientific or otherwise. They may very well be reproduced.

Short sentences and short paragraphs are commended. The following directions should be displayed in the boldest type in every newspaper office:—

"Accuracy, terseness, and fairness are the three fundamentals in newspaper writing. Kill your adjectives without mercy."

The "Don't" list includes the usual common errors, such as:—

"Over" for "more than."

"Secure" for "obtain."

"Consensus of opinion" for "consensus."

"Aggregate" for "total."

"Balance" for "remainder."

"Cultured" for "cultivated."

"Donate" for "give."

"Notice" for "observe."

All very sound inhibitions. The Americanism "onto" is among the other words banned.

In the rules for constructing "news stories" there are directions which apply equally well to all writing. Thus:—

"Be direct. Nine times out of ten an introduction is pure trash. The simplest form is the best."

"Use the active instead of the passive voice. It gives force to what you say. Put the adverb after the verb for the same reason."

"Use familiar words, write naturally. The

most forceful position of any word is at the beginning of a sentence. The next forceful position is at the end of a sentence."

There are several columns devoted to directions regarding capitalization and abbreviations. Practice varies in these matters in different newspaper offices. The Times, observing etymological accuracy, uses "z" in "capitalisation" and in words ending with the sound of "iz" or "ise," and this practice is followed generally in Canada and the United States.

Grammar and punctuation receive special attention from our mentor from the prairies. A reasonable course is adopted in regard to our old friend the split infinitive, which by the way, has slipped into the "Style Book." The rule laid down is to "use the split infinitive only when it adds strength to the expression." Examples are given of illiterate blunders which must be avoided, and advice offered on use of compounds, apostrophes, and all punctuation marks.

"Don't overwork the dash. Usually a comma will do as well."

Abstracts from Current Literature

MEDICINE

The Use of Calcium Chloride Given Intravenously in Congestive Heart Failure.
Stewart, H. J., *Am. Heart J.* 4: 6, Aug. 1929.

It has long been known that the calcium ion is essential to the contraction of heart muscle, dating from the observation made by Merunowicz in 1875 that perfusion with the aqueous extract of ash would keep up the contraction of the heart. With the establishment of this fact, and of the part played by potassium in relaxation and sodium in maintaining the osmotic pressure in the muscle tissues, an attempt was begun to connect the action of digitalis with the presence of these ions. The conclusions on the question varied. Clark's experiments led him to belief that the systolic action of digitoxin on the frog's heart depended on the presence of calcium ions, whilst other observers brought forward evidence to the contrary.

Further investigation by Loewi brought out the suggestion that a strophanthin (or digitalis) effect consists only in making the heart muscle receptive to calcium ions, and this increased receptiveness is followed by an increased calcium effect. In other words, digitalis bodies sensitize the heart muscle to the action of the calcium already present in the blood. He believed that the proportion of calcium was not lowered in heart failure, but the sensitiveness of the heart muscle to calcium was diminished. The same result was said to be attained if the calcium in

the blood was temporarily raised by intravenous injections.

Investigations were then carried out by a number of workers with regard to the value of intravenous injections of calcium chloride in congestive heart failure, and excellent results were reported. It was found that diuresis was promoted to a striking degree by this measure, and it was even more marked when digitalis was given at the same time, either orally or intravenously.

The present paper deals with two points: (1) whether calcium chloride in the amounts administered has an effect on the contraction of the heart muscle in man; and (2) its diuretic effect in congestive heart failure.

The results with regard to (1) may be briefly summarized as follows: calcium chloride was given on 7 occasions to 4 patients in whom the cardiac rhythm was normal and on 4 occasions to one patient suffering from auricular fibrillation. In no single instance was the extent of contraction of the left ventricle influenced by the drug. It was also administered on 5 occasions to 3 of the patients with a normal rhythm who had previously been given digitalis, and on 6 occasions to 2 patients with auricular fibrillation who were also receiving digitalis. No effect on the extent of the ventricular contraction resulted in any of these cases either. Nor could it be shown that the force of the heart beat was altered by the calcium chloride. Finally, electrocardiograms taken in connection with the

injection of the salt showed no changes in conduction time or in ventricular rate.

What were the results of calcium chloride as a diuretic? It was given to 12 patients with edema, both with and without digitalis. In one case there was a marked diuresis, but the patient was so ill that it was difficult to control the observations in his case, and later in his illness diuresis was obtained by the use of digitalis alone. The conclusion reached on this point was that calcium chloride did not produce diuresis in congestive heart failure: and digitalis did not appear to be any more effective as a diuretic in these patients when given in combination with the salt than when it was given alone.

It is worth noting that experimental results in dogs had been that large quantities of the calcium chloride *did* give rise to premature ventricular contractions, and if the doses given to patients had been comparable to the quantities used with dogs effects might have been detected other than the negative findings recorded. It did not seem wise, however, to give patients larger amounts than one grm.

H. E. MACDERMOT

The Increased Mortality Rate of Cancer.

Eggers, H. E. *J. Cancer Res.* 12: 9, 1929.

The author points to the fact that the alleged increase in the mortality from cancer has been explained as due to more accurate diagnosis and the prolongation of the life span. More people are now being preserved, to reach the cancer age, it is said. An attempt is here made to clear up the question whether the increased mortality rate in cancer is actual or only apparent by comparing the available figures with those appertaining to what are often called the "degenerative diseases", e.g., angina pectoris, chronic rheumatism, gout, cirrhosis of the liver, etc.

The author argues that if cancer has become more common because more people are reaching the cancer age, then the group of degenerative diseases should also show a parallel increase. He has investigated this point laying stress on the fact that conclusions should be based upon a study of the "group" degenerative diseases, in order to rule out any special factor that might influence one member of the group.

Studying the annual mortality reports of the U.S. Census Bureau for the period 1900 to 1924, the graph showing the ratio of the cancer incidence to that of degenerative diseases is a straight horizontal line from 1900 to 1918, indicating a practically identical rate of increases during that time for cancer and the degenerative group. From 1918 to 1924 a discrepancy occurs, attributable to the influenza epidemic. The mortality rate for cancer quickly returned to its original level, but that for degenerative diseases had not been re-established by 1924, owing

mainly to the reduction in the number of deaths from chronic nephritis resulting from the influenza epidemic, and, to a lesser extent, to the reduction of deaths from diabetes. The rectilinear, increased incidence of cancer is held to be a true increase, since if it was due to better diagnosis there would have been an increase in the cancer rate beyond that of the degenerative group, provided that it was not compensated by an actual decrease in the cancer rate.

A. G. NICHOLLS

The Care of the Surgical Diabetic. Ohler, W. R., *New Eng. M. J.* 201: 259, Aug. 8, 1929.

Generally, a surgical diabetic is a severe diabetic. The presence of sugar or diacetic acid is no contra-indication to surgical procedures. The presence of pus always increases the severity of diabetes. A case of general septicæmia may be kept sugar free with insulin, but insulin is of no help in halting the spread of the infection. Every septic wound in a diabetic should be seen every day by the visiting surgeon. The carefully bandaged, mildly gangrenous, toe may give rise to a septic foot and leg within twenty-four or forty-eight hours. Beginning coma in a non-surgical diabetic may present the symptoms of an acute surgical condition in the abdomen. In diabetic coma the skin is always dry and the patient nearly always has nausea and vomiting and a leucocytosis. The most important single service in the proper care of the surgical diabetic is to supply the patient with a competent special nurse, or to detail one of the ward nurses to the special care of the patient. Provision should be made for the frequent testing of the urine for sugar and diacetic acid on the ward. This is of much greater value than collecting a twenty-four hour specimen and waiting until the next day for the report.

On the day of operation the patient receives from 30 to 50 grams of glucose in the form of oatmeal gruel or orange juice at least two hours before operation. If the patient is receiving insulin give the morning dose as usual at the time of the glucose meal. During the operation keep the patient warm. In the severe case it is desirable to give 1000 c.c. of saline solution subcutaneously before the patient leaves the table.

Immediately after operation, start rectal tap water. Test the urine within the first hour and give insulin if necessary. Test the urine every two hours subsequently for the first twenty-four hours. Give insulin whenever necessary. Test the urine every four hours during the second day. Test the urine every six hours during the third day, which means three times a day before meals and at 10 p.m. Start fluids by the mouth as soon as possible. If fluids cannot be taken by the mouth carbohydrate in the form of glucose, by rectum or intravenously, should be

given. The patient should get at least 50 grams of glucose in the first twenty-four hours.

LILLIAN A. CHASE

Isolation of Tail of Pancreas in a Diabetic Child.

De Takats, G., and Wilder, R. M., *J. Am. M. Ass.* 93: 603, Aug. 24, 1929.

De Takats is reporting elsewhere experiments on dogs which bring additional evidence of the persistence, hypertrophy, and function of the islet tissue in the tail of the pancreas after separation of the tail from the body of the gland. The islets in the severed tail develop to an unusual size; mitotic figures appear in many sections.

This evidence raised the question whether hypertrophy of the islets and increased islet function could be brought about in a case of diabetes. A case was selected in whom the diabetes was considered to be beyond the stage when improvement from medical management could be anticipated. He was a boy aged 13, who first had glycosuria in 1921. His progress is here tabulated.

Date	Height (inches)	Weight (lbs.)	Calories in diet	Dextrose in diet (grm.)	Islet sugar	Insulin	Complications
March 1923	48	44	1435	98		15	
June 1923							Sore throat
Aug. 1923	48	55	1435	98	0.217	20	
Aug. 1924	50	58	1435	98		40	
Jan. 1926							Abscessed tooth
Feb. 1926	52	67	1435	98	0.312	40	Tonsillitis twice
July 1927	53	72	1854	120		40	Tonsillectomy
Jan. 1929	56	87	1854	120	0.045 at 12.15 p.m. 0.089 at 5 p.m.		

He was taking insulin in four doses, 15-5-5-15.

On January 20, 1929, the operation was performed. With an electro-surgical cautery the pancreas was divided as close to the midline as possible without endangering the inferior mesenteric vein. Recovery was satisfactory until the eighth day when the patient had abdominal colic. The abdomen was opened and a mass explored and drained of greenish yellow fluid, pancreatic juice. About four weeks later it was necessary to again open the abdomen in order to drain an abscess above the splenic flexure. His further progress is here tabulated.

Date	Weight	Calories in diet	Dextrose value of diet	Insulin	
March 27	69	1854	120	39	Reaction at 1 a.m.
April 3	73	1854	120	38	One reaction in week
April 11	78½	1854	120	38	No reactions
April 17	74½	1854	120	38	
April 26	78½	1854	120	38	Two reactions at 11 a.m.
May 2		1854	120	36-32	Two reactions.
May 9	80	1854	120	27-25	Reactions
May 17		1854	120	33	
May 25	80	1854	120	34	Reaction
June 4		2177	166	45	
June 18		2177	166	39	
June 27	80	2177	166	39	

Reviewer's comment. This was evidently one of those unstable cases that seem to balance uncertainly between glycosuria and hypoglycæmia. The most difficult problem in treatment is that of dividing the dose to make it effective. His fasting blood sugar at the time of operation is not given; it was probably high. There is no record of a fasting blood sugar since he had the abscessed tooth in January, 1926. His noon blood sugar at the time of the operation was low at 0.045 grm. per 100 c.c. In some patients a blood sugar as low as that would result in a reaction. No reactions are noted before the operation. In the six years since treatment began he gained forty-three pounds in weight and grew eight inches. His diet was increased 419 calories. His weight was within one pound of the normal, and his height was within two inches of the normal for his age. In four and a half years his insulin requirement has not increased and his diet was increased 419 calories. His morning dose of insulin could have been decreased or his breakfast could have been higher in food value, to combat the noon hypoglycæmia. Suppose the islet tissue in the pancreas increases rapidly and the boy has too great a production of insulin will not his last state be worse than his first? It was a daring and original piece of surgery. Further reports of the boy's progress will be awaited with interest.

LILLIAN A. CHASE

Intrakutane Schweissinjektionen und Tuberculose. (Intracutaneous Injections of Sweat and Tuberculosis). Dorn, E., *Zeitschr. f. Tuberk.* 51: 134, 1928.

The author states that the sweat of tuberculous persons, like their urine, contains antigenic substances. Acting on this belief, he tried intracutaneous injection of the sweat in 171 cases, and finds that the idea is supported by the facts in 81.3 per cent. The local reaction obtained is specific for tuberculosis. No general or focal reaction results from the test. A positive test signifies active tuberculosis; a negative one, in most cases, excludes active tuberculosis. The reaction is of diagnostic value, except at the beginning of active tuberculosis.

A. G. NICHOLLS

SURGERY

The X-Ray Treatment of Wounds. Freund, L., *Brit. M. J.* 2: 449, Sept. 7, 1929.

The beneficial influence of x-rays is due either to the stimulating effect of small doses or to the elimination of some factor delaying cicatrization.

Lupus vulgaris, epitheliomata, rodent ulcers, keloids, and pigmented nævi are treated by the author as follows: The affected area is

excised surgically. Without suturing, the wound is then treated by x-rays, immediately and on several successive days. By this method pathological masses are rapidly got rid of and what cells are left are more readily reached by the radiation. If the growth recurs it can easily break through the thin soft scar resulting from the above treatment. A recurrence is thus recognized earlier than if the wound were sewn.

The cosmetic result is good. Less time is required for treatment. Wounds in areas where the skin remains stretched are most suitable. If the wound is near a joint, the area under treatment has to be rendered immobile. Lesions in folds or angles of the skin are unsuitable for this treatment. Fairly extensive wounds treated in this manner have given good results. One is mentioned having a diameter of ten centimetres. Healing is not delayed.

A dose slightly higher than an epilation dose is given, about 6 to 7 H, unfiltered.

R. V. B. SHIER

Mortality of Enterostomy in Acute Ileus. Van Beuren, F. T., Jr., *Ann. Surg.* 90: 387, Sept. 1929.

Not until the public and the profession realize that delay in acute ileus means danger will the mortality curve fall. Among technical procedures affecting beneficially the mortality rate enterostomy has been warmly advocated. The author gives two series of late cases, one with, and one without, enterostomy, and compares the mortality. The series are further divided into three periods of four years each.

The time divisions show that the diagnosis of acute ileus is being made earlier and more often. Also that the mortality has been reduced in the last four years, and that enterostomy is being done about three times as often as in the first four years of the series. In the first four years the mortality rate in late cases (after forty-eight hours) was 81 per cent. In the last period it was 61 per cent.

Enterostomy done at the right time is the most effective means known at present for overcoming intestinal over-distension and anæmia.

R. V. B. SHIER

Résultats immédiats de quatorze thoracoplasties pour tuberculose pleuro-pulmonaire. (The immediate results in fourteen cases of thoracoplasty for pleuro-pulmonary tuberculosis). Morin, Cardis, et Picot, *Rév. Méd. de la Suisse romande* 48: 999, 25 nov., 1928.

The following statistics are given. Seven patients appeared to be cured. Cough had ceased and tubercle bacilli had disappeared from the sputum. Six had had a total thoracoplasty and one a partial thoracoplasty. Four patients were improved, but were still expectorating bacilli.

In the case of one, operated on for pyopneumothorax by total thoracoplasty, the suppuration had almost entirely cleared up. Two patients died; one from bilateral extension of the tuberculous lesions, and one from pleuro-pulmonary perforation.

The authors reserve the operation of thoracoplasty for those cases which show a very marked tendency to spontaneous fibrosis of the lesions, and, also emphasize the moral effect of the operation.

A. G. NICHOLLS

GYNÆCOLOGY

Fifteen Years with Radium in the Treatment of Fibroids, Non-Malignant Bleeding and Dysmenorrhœa. Polak, J. O., *J. Obst. & Gynec. Brit. Emp.* 36: 325, 1929.

The value of radium in the treatment of carcinoma of the cervix is well established, but in non-malignant bleeding its indications and value are less clearly recognized.

In most uterine fibroids the treatment of choice is operation. If, however, the tumour is smaller than the uterus in a three months' pregnancy, radium may be used, and is to be preferred if the patient is a poor operative risk. It is however contraindicated in fibroids complicated by pelvic inflammation, or if the tumour is causing pressure symptoms, or if the diagnosis is at all doubtful. In the series reported less than one-third of the fibroids were radiated, and in these the dose varied from 1,800 to 2,000 mgm. hours.

Where the cause of the menorrhagia is sub-involution or fibrosis uteri the intrauterine application of radium seldom, if ever, fails to effect a cure. Excessive irregular bleeding, even at the menopause, always demands investigation, and if malignancy is not present the simple application of radium after the curettage gives very satisfactory results. Should hæmorrhage recur after a period of amenorrhœa, hysterectomy may then be necessary.

In young girls, suffering from menorrhagia and a resultant anæmia, a hypertrophic endometrium is usually found. This condition may also be treated successfully by curettage followed by a small well-screened dose of radium. (200-300 mgm. hours). In the case of patients so treated, who later became pregnant, no defect was found in the child.

ELEANOR PERCIVAL

Leucorrhœa with Special Reference to Trichomonas Vaginalis. Davis, C. H. *Am. J. Obst. & Gynec.* 18: 196-203, 1929.

Leucorrhœa is perhaps the most common of gynecological complaints. The cause of the abnormal discharge may be: (a) parasitic or infective; (b) local; (c) constitutional; (d) cir-

culatory. *Trichomonas vaginalis* is a flagellate parasite, which, if sought for in fresh secretion, will often be found to be the cause of persistent very irritating vaginal discharges. A mistaken diagnosis of chronic gonorrhœa is sometimes made.

In acute cases, treatment should include sitz baths, douches and rest. Later, when the acute stage has passed, a speculum should be introduced, the vagina carefully dried, and then painted with 5 per cent mercurochrome. Following this, a glycerine tampon is inserted, and if advisable, the patient uses a lactic acid douche. This treatment is carried out four times a week, until all the parasites have disappeared and the vaginal mucosa is healthy. Sometimes an alkaline powder "Bisodol" is effective. As this *T. vaginalis* infection of the vagina may be associated with intestinal infection by the same parasite, the bowel should be kept open and the patient advised to wash with soap and water after stool. The patient should be examined for several months after menstruation, and a negative slide obtained, before being pronounced well.

ELEANOR PERCIVAL

PÆDIATRICS

Icterus Neonatorum. Goldbloom, A., and Gottlieb, R., *Am. J. Dis. Child.* 38: 57, July 1929.

Recent advances in knowledge of blood destruction, bile formation, and function of the reticulo-endothelial system, together with the discovery of techniques for determining the degree of bilirubinæmia allow the vexed question of the etiology of icterus to be studied more critically and investigated with more precision of method than heretofore.

Goldbloom and Gottlieb discuss the numerous conflicting theories of the etiology of icterus neonatorum and present data to show that jaundice of the new-born is "a physiological condition which is the result of a postnatal readjustment from an environment requiring the presence of a polycythæmia for the maintenance of oxygenation to one in which no such extraordinary measures are necessary."

The fact that the umbilical cord blood in all cases gives an indirect van den Berg reaction shows that every child at birth, whether visibly jaundiced or not has icterus—which is defined as an increase of bile pigment in the blood serum.

Ten samples of oxalated cord blood were placed in test tubes in a refrigerator and red cell counts were made at frequent intervals. At the end of 144 hours nine tubes showed complete hæmolysis, while the tenth showed a like result somewhat delayed. In tubes of adult blood little or no change occurred. Red cell counts on peripheral blood of newborn infants

showed an initial polycythemia with an early rapid fall over the first four or five day period, followed by a rise.

Of 39 samples of cord blood 37 showed increased fragility of the red blood corpuscles. Identical curves were obtained when the fragility test was done with cord blood at birth, with cord blood exposed to physiological saline, and with cord blood exposed to maternal serum. The peripheral blood of newborn infants showed in nearly every case an increased fragility of the red corpuscles which decreased until after one week the curve paralleled that for the normal adult.

Blood smears showed a marked increase in nucleated and reticulated red cells in the newborn with an almost total disappearance of these immature forms about the end of the first week of life. Study of the un hæmolized portions in the fragility experiments showed that these immature cells were largely responsible for the increased fragility. It was noted that the disappearance of these young cells from the peripheral circulation coincided with the assumption of a normal fragility curve, thus pointing to a direct relationship between immature circulating cells and fragility.

The indirect van den Berg test was positive in all of 34 samples of cord blood, and the peripheral blood of all infants examined showed an increased icteric index. Icterus neonatorum is a physiological condition present in all newborn infants in varying degrees. Its association with the disappearance of the polycythæmia and of the immature red cells, with the increase of fragility of the red cells, with an indirect van den Berg reaction and a high icteric index indicates its hæmolytic origin and nature. The peculiarities of the fetal circulation impose a condition of oxygen want on the fetus; the bone marrow is thereby stimulated to the increased production of red cells; with birth, conditions due to prenatal anoxæmia must be adjusted to a new environment of normal oxygen tension; excess red cells are destroyed; a hæmolytic icterus results.

A. K. GEDDES

Pathology of So-Called "Acute Pyelitis" in Infants. Wilson, J. R., and Schloss, O. M., *Am. J. Dis. Child.* 38: 2, 1929.

Wilson and Schloss demonstrate by a study of post-mortem material from 49 children under three years of age, all of whom had shown well-marked pyuria during life, that the most common cause of severe acute pyuria in young infants is an acute inflammation of the kidney substance. Lesions in the renal pelvis were infrequent and relatively insignificant; lesions in the kidney tissue varied from small circumscribed areas of mononuclear and polymorphonuclear-celled infiltration to frank abscess formation with necrosis, and in old healed cases

scar tissue. In 22 of the 28 cases, in which the pyuria had been ranked as mild or moderate, focal inflammatory lesions of the interstitial tissue of the kidney were found; in all of the 17 cases in which the pyuria had been severe, necropsy revealed acute suppurative nephritis; in the three cases of pyuria with recovery, which subsequently came to autopsy as a result of extra-urinary infections, scar tissue was found in the kidneys.

None of the 49 cases showed any marked congenital anomaly of the urinary tract. There was no great preponderance of females over males. The demonstration of acute suppurative nephritis as the common cause of pyuria in infants lends support to the view that the infection is hæmatogenous and explains the ineffectiveness of the usual therapy.

A. K. GEDDES

ANÆSTHESIA

Pre-Medication by Paraldehyde in Children.

Sington, H., *Proc. Roy. Soc. Med.* 22: 1197, 1929.

The terror which some children experience when given an anæsthetic may permanently damage their nervous systems. The ideal plan, when a child has to be operated upon, would be to anæsthetize him while he is asleep. The writer gave paraldehyde in a series of one hundred operations upon children. The dose was one drachm to every fourteen pounds of body weight. It was given per rectum. The patients fell asleep within half an hour and

were given ether without being awakened. They all slept for nine or ten hours afterwards. Only one child vomited after operation. Another was noisy and obstreperous after waking up. With these two exceptions there were no bad after effects. The patients varied in age from sixteen months to twelve years, and were selected because they were obviously excitable and nervous.

W. B. HOWELL

Guérison d'une Syncope Anesthésique par l'injection Intrarachidienne de Cafféine après Echée de l'adrenaline intracardiaque. (The Cure of an Anæsthetic Syncope by Intraspinal Injection of Caffeine after Failure of Adrenaline Injected into the Heart). Bloch, R., *La Presse Médicale* 35: 108, Jan. 23, 1929.

A woman of sixty-eight years of age was to be operated upon for an ulcerating cancer of the breast. General and local anæsthesia were both considered unsuitable. A spinal injection of 5 centigrams of scurocaine, mixed with 25 centigrams of caffeine, was given in the space between the last cervical and first dorsal vertebra. Five minutes afterwards respiration and pulse failed. Adrenaline was immediately injected into the heart, but without effect. During two or three minutes artificial respiration was carried out, and then 50 centigrams of caffeine were injected into the sub-dural space where the first injection had been made. There was, at once, a deep inspiration and the pulse reappeared. The operation was carried out and convalescence was uneventful.

W. B. HOWELL

HUMAN OVA FROM UTERINE TUBES.—The material used by J. P. Pratt, Edgar Allen, Q. U. Newell, and L. J. Bland, for study was obtained from tubes removed in connection with fibromyomas and endometrial implants. Some tubes were washed *in situ* when none of the pelvic organs have been removed. When the tubes were not to be removed, the uterus was compressed by uterine elevating forceps applied just above the cervix. A small needle with a syringe attached was then introduced through the muscle into the cavity of the uterus. Salt solution was then injected into the cavity and allowed to run out through the tube. One tube was compressed with the fingers while the other was being washed. The fluid was collected as it ran out the fimbriated ends and was carefully searched for ova. This method is also useful to test the patency of the tubes. In the second method, when the tubes were removed at operation they were first dissected free from the mesosalpinx. A small cannula was fixed in the fimbriated end of each tube and then washed with physiological solution of sodium chloride. The washings were then examined for ova. Freeing of the tube seemed necessary, as otherwise there might have been a kinking which would have interfered with successful washing. The cases studied represented all stages of the menstrual cycle. The most suitable material was found at operations occurring near the middle of the intermenstruum. Nine specimens in all were obtained which on first ex-

amination in salt solution seemed to be ova. Five of them were definitely identified as ova by further study after fixation and section. One was obtained on the fifteenth day of the intermenstruum (fifteen days after the onset of the flow). Two others, which were twin ova, one obtained from each tube, were also found on the fifteenth day. A fourth ovum was obtained on the sixteenth day. This evidence therefore places ovulation before the fifteenth or sixteenth day. The twin ova were most nearly normal. Sections showed that these ova had already extruded the first polar body and had formed the second maturation spindle. The next specimen recovered also had formed a polar body before ovulation, although the maternal chromosomes could not be located. Another had two polar bodies. As the ovum fragmented during fixation and dehydration, this observation could not be checked in sections. These observations supply the first evidence as to the stage of maturation reached at ovulation by the tubal ovum of man, a point under controversy in the recent literature. Ovulation, dated from the onset of the previous menstruation, preceded the sixteenth day in one case, the fifteenth day in three cases and the fourteenth day in one case. These data further confirm the observation, based on the condition of the corpus luteum, that ovulation occurs most frequently at the middle of the intermenstruum.—*J. Am. M. Ass.* 93: 534, Sept. 14, 1929.

Obituaries

Dr. Stephen Rice Jenkins, F.A.C.S., Prince Edward Island's most distinguished physician, died at his home in Charlottetown, September 15th, after a brief illness. He was apparently in his usual good health until September 9th when he developed an acute cholecystitis. This was complicated three days later by the onset of pneumonia in the left lower lobe, which, in spite of a very gallant fight, brought the end on the evening of September 15th.

Dr. Jenkins was born in Charlottetown, November 12, 1858, the son of Dr. J. T. Jenkins, a prominent practitioner of that time. He obtained considerable medical training in his father's office both before and during his medical course, which he received at the University of Pennsylvania, graduating in 1884. After a year's internship in the Old Blockley Hospital, Philadelphia, he returned to practice in Charlottetown, immediately plunging into the hectic work of the 1885 smallpox epidemic. He remained in active practice here until his last illness.

His exceptional qualities of heart and mind gradually secured to him the largest medical and surgical practice on Prince Edward Island, which preëminence he maintained to the end.

A man of keen intellect, indefatigable energy, and ever youthful spirit, he managed, in spite of the heavy demands of his practice, to keep abreast of the latest advances in medicine; while his high sense of honour, kindly tolerance and mature wisdom won for him the affectionate esteem of patients and fellow practitioners alike.

An efficient executive, he was an active and valued participant in the councils of the Canadian Medical Association as well as of the local societies. His appointment to the presidency of the Canadian Medical Association for 1928 was a fitting recognition of his standing among his medical associates.

As a citizen of Charlottetown and Prince Edward Island he played an equally important rôle. Early associating himself with the local militia as medical officer of the 4th Regiment Heavy Artillery, he rose to the rank of Lieutenant-colonel, afterwards serving for a considerable period during the war as officer commanding Rockhead Military Hospital, Halifax. In 1912 and 1915 he was elected as Charlottetown representative to the provincial legislature. Interested in every movement that had for its purpose the betterment of hygienic, social and educational conditions he gave generously of his time and money. During his long career he was closely associated with both hospitals in Charlottetown, the local Red Cross Society, Anti-tuberculosis Society, Social Hygiene Council, City School Board and numerous other civic organizations,

all of which owe a great deal to his tireless energy and organizing ability.

Dr. Jenkins' death has left a great gap in the medical and civic life of his native province. Through the passing years his memory will be cherished by all who knew him as the ideal citizen, the ideal physician, "A man who went about doing good."

The deceased leaves to mourn his widow; three sons, Dr. J. S. Jenkins and Charles Jenkins of Charlottetown, Harry G. Jenkins of Paris, France; also six daughters, Mrs. Ivan Reddin, Alberta, the Misses Nora and Hilda Jenkins of New York, and the Misses Margaret, Helen and Stephanie Jenkins of Charlottetown.

J. W. MCKENZIE

AN APPRECIATION

The death of Dr. Stephen Rice Jenkins is regretted not only by his professional confrères but by people in every walk of life in this city and province and throughout the Dominion. Actively engaged in his professional work on Monday, September 9th, indisposed the same day, on Tuesday confined to his home, on Wednesday endeavouring to see his patients, on Thursday stricken with pneumonia, on Friday and Saturday with the resources of both hospitals at his disposal, he fought a great but losing fight, and on Sunday, September 15th, he passed to his reward. The writer was intimately acquainted with Dr. Jenkins for many years and can testify that his advice and counsel, whether in the home or hospital, were always highly prized. His activities in Red Cross work, social hygiene and education, are well known, but it was as a general practitioner that he climbed to the highest pinnacle in his profession. His skill as a physician and surgeon could only be attained



Dr. Stephen Rice Jenkins

by constant visits to great centres of learning, by keeping abreast of the times, and the application of his knowledge. He will be missed in the local medical society, in the medical Council, of which he was Registrar, in the Canadian Medical Association, of which he was President last year, and in the organizations of both hospitals, where his advice was always invaluable. In a word, the profession has lost a very capable, careful, and successful practitioner, and his associates in private life will greatly miss a companion possessing the kindly, genial qualities of Dr. Jenkins. In conclusion, his standing as a physician may be summed up in the words of Robert Louis Stevenson: "Among the men and classes of men who stand above the common herd, the physician easily occupies first place. He is the flower, such as it is, of our civilization, and when this stage of man is done with and only to be marvelled at in history, he will be thought to have shared as

little as any in the defects of the period and notably exhibited the virtues of the race. He possesses in a marked degree generosity, tact, discretion, and, what are more important, herculean cheerfulness and courage, so that he brings air and cheer into the sick room and often enough, though not as often as he wishes, brings healing."

G. F. DEWAR

The Hon. Dr. R. G. Brett. With the passing of the Hon. Dr. Brett, western Canada has lost her best known physician, who for a period of nearly forty years was intimately associated with the medical and political affairs of the west. His death was not unexpected, as he had for some time been in failing health. He died at the Holy Cross Hospital, Calgary, on September 16th at the age of seventy-eight years. He was a man of fine character, of strong yet most genial personality, fine mentality, with an ever present sense of humour which won him many friends and which must have carried him through many a difficult situation. The medical profession of Alberta mourn his loss, since he was personally known to the great majority of the older members and greatly beloved. He was facile princeps among the early medical pioneers in this western country. The greater part of his professional life was spent at Banff, Alberta, where, in 1886, he founded the Brett Sanitarium which still continues as a very active institution.

Dr. Robert George Brett was born at Strathroy, Ontario, on the 16th of November, 1851, the son of James and Catherine Mallon Brett. He received his early education at the Strathroy Grammar School. He graduated in medicine from the Victoria College at Cobourg, Ontario, in 1874, and began his professional career at Arkona, Ontario, in the same year practising there until 1879. He found time during this period to take post-graduate work in New York and Philadelphia. In the year 1880, Dr. Brett came west to Manitoba, and not long afterwards became associated with others in the founding of the Manitoba Medical College and Manitoba University. In this institution he was Professor of Materia Medica and Therapeutics and later on Professor of Gynecology and Obstetrics.

In 1886 Dr. Brett settled in Banff, not long after the first transcontinental railway had been built. He early recognized the great possibilities of this beauty spot, not only as a pleasure resort but as a health resort as well. The hot sulphur springs, moreover, have even at this time enjoyed a fairly wide repute for their healing properties. He utilized these waters in his newly built sanitarium. The name of Dr. Brett will long be associated with Banff. In 1894 he pursued post-graduate studies in Vienna. He served as a member of the Council of the College of Physicians and Surgeons from 1889 until 1906, when the Province of Alberta came into existence. He was president of this council in 1891 and 1897. He was also a member

of the same body in the Province of Alberta between 1906 and 1915 and president in 1906 and 1907. He later served as a member of the Dominion Medical Council.

Dr. Brett was elected in 1888 to the first Legislative Assembly of the Northwest Territories, and held his seat in this body until 1901. He was president of the Executive Council of the Northwest Territories from 1889 until 1891. He was president of the Alberta Conservative Association in 1909. He was appointed to the Senate of the University of Alberta in 1908 and in 1912. He was appointed Lieutenant-Governor of the Province of Alberta in 1915, and held this office with conspicuous ability until 1925. During the

war he was greatly interested in Red Cross work and became president of this institution in this province. For a time he was Chief Scout for the province. It is said that his contact with the Boy Scout movement was one of great interest, and that he almost invariably attended each meeting of the provincial branch.

Dr. Brett was married in 1878 to Louise T. Hungerford. Two sons, Harry and Earl, both died a few years ago. The former, Dr. Harry Brett, practised in Banff for many years, and was a prominent member of our profession.

The Hon. Dr. R. G. Brett was buried at Banff, following a service held in the Anglican Church, which was attended by a large and representative gathering. In this connection it may be mentioned that some years ago, Dr. Brett donated to this church a splendid set of chimes which will serve to perpetuate his memory.

The sympathy of the medical profession in Alberta is extended to his widow.

G. E. LEARMONTH

AN APPRECIATION

The life of Hon. Dr. Robert George Brett in its effects upon the life of a community

was larger than that merely of an individual. Dr. Brett was almost an institution in Western Canada. Not that he lacked personality, for he fairly bubbled with it, but that the work he undertook and the influence he possessed was such as to affect materially the sanitary and health legislation of a considerable portion of Canada.

First, however, to speak of him as an individual. He was a man of strong opinions and of strong political sympathies, even prejudices, but he never allowed his opinions or his prejudices to interfere with his personal friendships. It is told that when he and Hon. Arthur Sifton were campaigning against one another, Dr. Brett did not turn up at a joint meeting on time. After waiting a little while, Mr. Sifton told the audience that he knew exactly what Dr. Brett would say and that he would deliver Dr. Brett's speech for him, which he proceeded to do. While Mr. Sifton was making his Conservative speech, Dr. Brett came into the back of the hall and applauded him vigorously, saying that Mr. Sifton could explain Conservative politics better than he could himself.

Another notable feature of Dr. Brett's character was his entire absence of false dignity. During his



Hon. Dr. R. G. Brett

for me to speak of his abilities as an ophthalmologist, and so on. I have known of him for long, but it is only in the past two or three days that I have enjoyed the pleasure of his personal acquaintance. He has shown that he is one of the best of good fellows, and I am sure he will be in every way as successful as his predecessors have been. And I may say that in the short time that Mrs. Harvey Smith has been in this city we have all been impressed by her manifold charms and graces. She has gained the golden opinion of all those with whom she has come into contact. I am sure that in the hands of Professor and Mrs. Harvey Smith the meeting at Winnipeg will be a tremendous success, and that all those who may have the good fortune to go will have the time of their lives."

Professor Harvey Smith, who was very cordially received, said: "Mr. President, ladies, and gentlemen, I thank you from the bottom of my heart for your kind words. And I thank the Association for their kindness in appointing me to this great office to carry on the affairs at Winnipeg next year. Though I have been connected with many American enterprises, nothing I have ever undertaken has given me greater pleasure, or provided me with a greater interest, than the work which now lies before me. In this connection I acknowledge, with very great thanks, our indebtedness to the officers of the Association, especially, to my good friend Dr. Alfred Cox, who has been 'a lamp unto my feet and a light unto my path.' I have written him numberless letters, on all sorts of topics, and he has been patience personified; he has never failed me. The first invitation which was extended for the Association to meet in Winnipeg was thirty-three years ago, which seems a long time to wait, but ultimately this great reward has come to us. Need I say how welcome you will be in every portion of Canada?"

It is more than a scientific meeting; it is a gathering together of brethren of the British Empire. Thank you again for your kindness." (Applause.)—*Brit. M. J.*

Revision of the Pharmacopœia

The Pharmacopœia Commission established by the Council at the instance of the Pharmacopœia Committee has been diligently at work under the able chairmanship of Dr. A. P. Beddard. Considerable progress has been made with the work of revision and satisfactory relations formed with the authorities in the several overseas Dominions. The Committee has also appointed Mr. Charles Herbert Hampshire, M.B., Ph.C., to be Secretary to the Commission. Not only is Mr. Hampshire doubly qualified in medicine and pharmacy but he also has a wide acquaintance with pharmacopœial literature and research which will enable him to render specially valuable service to the Committee.

Radium Research

At the London Hospital the new radium department is now in working order. The recent gifts of a gram of radium each from two anonymous donors, together with a sum of £13,000 in addition from one of the donors for the endowment of the department, have placed the hospital in an exceptional position as a centre for treatment by radium, and for research into treatment by that method. One gram of radium has been delivered and is being used for the making of radon, primarily for the use of the hospital patients. As more radon can be made than the institution actually requires, arrangements have been made for supplying it, at a charge, to other hospitals and to members of the staff for private cases.

NOVA SCOTIA

The report on the vital statistics of Canada for the year 1926 shows that ninety-one centenarians died during that year. Of these, sixteen were residents of Nova Scotia. With less than 6 per cent of the population of the Dominion, the Bluenose province contrived to supply nearly 18 per cent of the centenarian deaths.

A rumour that Dr. F. R. Little, of Halifax, had been killed in a motor accident, was recently widely circulated and naturally greatly shocked the genial doctor's many friends. Fortunately he was able to produce convincing evidence that the rumour was unfounded but it is said that several persons who telephoned his house to express sympathy received a second shock when the telephone was answered by his familiar voice, which quite lacked any ghostly quality. His experience was perhaps rather less disturbing than that of Dr. Murdoch Chisholm, who, on the day of the Halifax disaster of 1917, had the peculiar privilege of reading in an evening paper of the universal regret that he should have been among those who lost their lives on that memorable occasion. Perhaps the most amusing feature of Dr. Little's experience was the incredulity of some who seemed unable to fully accept his declaration that he still lived comfortably and happily.

Following the capture of Louisbourg by New England forces under Pepperell, in 1745, the French at once set about preparations for the recapture of their lost stronghold. A mighty naval and military force was

mustered and placed under the command of the Duke d'Anville. Storm after storm delayed and scattered the fleet, and when d'Anville at last reached the chosen rendezvous, now Halifax harbour, his ship had but a solitary consort and he found only one ship awaiting him. Others straggled in from time to time, but the expedition was doomed to misfortune. The commander died of apoplexy, and an infectious disease (some think it was typhus, others that it was smallpox) worked havoc with sailors and soldiers. It is said that fully 2,500 perished and were buried along the shores of what is now known as Bedford Basin. On the fourth of September of this year, a cairn was dedicated to their memory. This was erected by the Nova Scotia branch of the Canadian Historical Sites and Monuments Commission, and dedicated with fitting ceremony. France sent a new war ship to participate in the event, and England and Canada were represented by H.M.S. Despatch and H.M.C.S. Stadacona. The ceremony recalls one of the most melancholy incidents in the early history of Canada, and reminds us of the frequency and fatality of epidemics in those days.

Dr. Jaynes and Macfarlane, of Toronto, were recently in Nova Scotia, lecturing under the auspices of the Canadian Medical Association. They addressed meetings of the Cape Breton and Eastern Counties branches of the Medical Society of Nova Scotia. In October, a team, composed of Dr. J. R. Goodall, of Montreal, and Drs. S. R. Johnston and S. L. Walker, of Halifax, addressed branches of the Society at Amherst, New Glasgow, Truro, Bridgewater, and Kentville.

Twelve members of the nursing staff of the St. Martha's Hospital, Antigonish, were awarded diplomas at graduation exercises which were held on September 24th.

Drs. A. M. Marshall and R. A. H. MacKeen, of Halifax, have been appointed to the staff of the Dalhousie Clinic.

W. H. HATTIE

NEW BRUNSWICK

A largely attended meeting at Chatham, on September 15th, considered ways and means for the better combating of tuberculosis on the North Shore. The feeling of the meeting was that a tuberculosis sanatorium was necessary in this part of the province. Dr. Collins, of Riverglade, and Dr. Melanson, Tuberculosis Consultant for the North Shore, at this meeting met the physicians of the Hôtel Dieu Hospital, Chatham, and the Miramichi Hospital, Newcastle.

Under the auspices of the Provincial Department of Health additional clinics for immunization against diphtheria have been established, notably at Gagetown and Jemseg. The response to the desire of the Department has been most gratifying.

It is hoped that the new Nesbit wing to the Saint John County Hospital will be ready for the official opening early in November. Good progress has been made by the contractors, and the necessary additional corridors have been constructed to link the new wing with the main building. At the same time considerable additions have been made to the nurses' home, and several new sleeping galleries have been added to the older building.

Dr. W. E. Rowley, of Saint John, has been confined to his home for a month suffering from septic sore throat.

A severe form of nose and throat infection has lately been prevalent in the province. The symptoms of cold in the head, with much bronchitis, has been complicated by gastro-intestinal upsets, among which diarrhoea is a distressing symptom. This epidemic is also characterized by a rather severe depression and occasionally by prostration.

Dr. W. W. White, Mayor of Saint John, and Dr. A. S. Kirkland, General Public Hospital, Saint John,

were the medical speakers at the annual meeting of the New Brunswick Society of Registered Nurses.

The New Brunswick delegation to the forthcoming meeting of the American College of Surgeons will include Drs. A. E. Macaulay, V. D. Davidson, D. C. Malcolm and G. A. B. Addy, of Saint John.

Dr. John T. Lewis, Hillsboro, died suddenly on October 2nd.

Dr. B. F. Johnson who has practised for many years in West St. John has left for California.

Dr. H. L. Abramson, Provincial Pathologist, was a Crown witness at the circuit court at Chatham this week.

Brigadier-General George Acheson, M.D., has been forced to discontinue his practice at St. Martin's owing to ill health. Dr. Acheson has been a patient at the Infirmary, Saint John, for some weeks and is leaving shortly for Ontario.

Dr. C. G. Main, of West St. John, is slowly recovering from a serious illness complicated by phlebitis. Dr. Main is at present convalescing in the north of the province.

Dr. W. O. McDonald and Dr. D. W. Buchanan have been gazetted as provisional lieutenants of No. 1 General Hospital, C.A.M.C.

Dr. H. B. Bustin has been promoted to a captaincy in No. 14 Field Ambulance.

Dr. George Antoine Cloutier, of St. Leonard's has been gazetted as a provisional lieutenant, C.A.M.C.

A. STANLEY KIRKLAND

QUEBEC

The City of Montreal has finally adopted a by-law creating a Board of Health for the city. The history of the movement which has led to this decision is too long to be told here. It will be enough to recall that it was due to the disinterested and unflagging efforts of a group of Montreal citizens that money was found to make a thorough survey of the health conditions in the city, out of which survey came the suggestion that this Board of Health be created. The whole movement is one that reflects the greatest credit on the energy and broadmindedness of those responsible for its initiation and successful prosecution.

The Board is to consist of nine members, two of whom will be appointed by McGill University and two by the University of Montreal. The other five will be appointed by the city and will include three aldermen, the director of the Health Department and the chairman of the city executive. It had been suggested that representatives should be sent from the Board of Trade and the Chamber de Commerce, but this proposal was finally dropped.

The Board will be an advising body only: it is to advise the civic authorities on any matters pertaining to hygiene and submit to the Executive Committee such recommendations, or suggestions as it may deem advisable to make on any question relating to public health which it shall have considered, either at the request of the said Committee or on its own initiative.

"The members of the said Board of Health shall remain in office until their successors have been appointed and shall be entitled to an honorarium of \$... whenever they attend a meeting of the said Board."

Specially bound copies of Sir William Osler's booklet, "A way of life" were presented to second year students of the Faculty of Medicine of McGill University. Dr. W. W. Chipman, Professor of Obstetrics and Gynecology, gave a short memorial address on the life of the late Dr. W. Grant Stewart, who instituted the annual presentation of Osler's booklet, which has since been carried on by Mrs. Stewart. Dr.

Charles F. Martin, dean of the faculty of medicine presided.

Dr. Henri A. Lafleur, of McGill, received the degree of Doctor of Letters, *honoris causa*, at a special convocation held at Queen's University on October 11th.

Dr. Georges Mauriquand of the faculty of science of Lyons, is now giving lectures in Montreal until November 4th, in the amphitheatre of the faculty of medicine, University of Montreal, under the auspices of the Institut Franco-Canadien. The visitor will speak on "The sick child."

An annex, estimated to cost \$150,000, will be added to the civic hospital of Quebec, it was decided by the administrative committee of the City Hall.

The entire community will join in hearty congratulations to the Jewish population upon their notable achievement in collecting \$1,570,139 for a new hospital in Montreal. This was far in excess of the million dollar objective and especially of the \$600,000 objective first modestly suggested. Those responsible for promoting this worthy object will thus have the sum of \$1,570,139 with which to build and endow a new house of healing in Canada's metropolis. The need for this has long been apparent. No city of its size on the continent is more badly under-hospitalized. The building it is proposed to erect should go a long way towards meeting the present need, since it will not be confined to Jewry alone, but will be open to all races and creeds. It will stand for the latest skill that science has made available and it will serve to relieve the tremendous pressure that has weighed for far too long upon the hospitals already in existence here. The fact that the Jewish people made no direct appeal to citizens outside their own religion only serves to emphasize the magnitude of the triumph their efforts have won. While many contributions to the fund came from outside of their own race, these were tributes in recognition of the merits of their drive, and made clear beyond doubt that they enjoyed the sympathetic support of the whole body of citizens.

The new addition to the Immigration Hospital at Savard Park was formally opened by Dr. Henri Laurin, in the presence of officials of the Federal Department of Health, and railway and steamship officials. There are 180 beds in the new wing, which is fireproof and equipped with modern appliances.

There are now 27 doctors and 80 nurses attached to the child hygiene section of the city's department of health, according to a report published by Dr. S. Boucher. At the beginning of the current year there were but 20 doctors, many on part time, and 50 nurses. There are now 25 doctors acting on full time and 70 nurses on full time duty to this department of work. The child hygiene section deals with school inspections, baby clinics, the prevention of infant mortality, pre-

venting contagion among children, helping mothers to take care of their little ones, supervision of children's boarding houses, and carries on a program of pre-natal and pre-school age medical and hygiene work.

With the exceptionally high infantile mortality rate of 588.2, comprising 10 deaths of children under one year, as against a total number of births of 17 during the month, Chicoutimi headed the list in the Province of Quebec for the month of June, according to vital statistics issued. Rimouski, with a rate of 250, which comprised 5 deaths out of a total of 20 births, was second; and Shawinigan, with a rate of 197.6, comprising 12 deaths out of a total of 61 births, was third. Hull led the province for July in the same category, with a rate of 236.1, there being 17 children dead out of a total number of births of 72, while LaTuque was second, and Rimouski third. The provincial birth-rate for June was 29.9 per thousand, slightly higher than that of the following month when it dropped to 28.7, but the June infantile mortality rate of 100.1 per thousand, was above that of July, when the figures recorded were 93.2.

The Premier, after a visit from the Minister of Agriculture, accompanied by a delegation headed by Prof. J. E. Dube, M.D., of the Hotel Dieu; Dr. J. A. Jarry, chief medical officer of the Bruchesi Institute; J. B. Baillargeon, well-known business man, stated that the government was as ready as ever to assist in the anti-tuberculosis campaign. Nine hundred more beds are necessary to face the ever-growing needs, it was pointed out by the delegation. A city hospital of 400 beds to care for those in the early stages of the disease would be of considerable assistance, while an addition of 500 new beds to Camp David for juveniles is said to be of primary importance. Mr. Taschereau told the delegation that he was quite ready to co-operate to the limit in the fight against tuberculosis, and he invited the delegates to ask the population of Montreal to make up for a generous subscription in order that the \$100,000 to be possibly subscribed by the government might not be taken as the end and limit of possible assistance.

Dr. A. G. Morphy announces that Lovat Hall, a private hospital for nervous and mild mental cases, will be ready to receive patients about the end of December.

Lovat Hall is situated two miles east of Lancaster, Ontario, on a very fine estate of fifty acres, bordering on Lake St. Francis, one of the most beautiful parts of the St. Lawrence River. Further particulars will be given in the December number of this *Journal*.

Dr. B. Alexander, formerly of the Montreal General Hospital, has been appointed chief medical officer of the Royal Eye Hospital, Manchester, England.

Dr. L. P. Ereaux and Mrs. Ereaux have returned to Montreal from Vienna, where the former has been pursuing post-graduate studies. GEORGE HALL

ONTARIO

On September 10th, at a meeting of the Hastings and Prince Edward Counties Medical Society, held at Stirling, Dr. A. B. LeMesurier, of Toronto, gave an address on "Acute abdominal conditions of childhood."

The Grey County Medical Society met at Owen Sound on September 18th, when the following addresses were given: Dr. F. W. Rolph, Toronto, "The interpretation of the signs and symptoms of chronic gastro-

intestinal disease;" Dr. W. E. Ogden, Toronto, "Early diagnosis of pulmonary tuberculosis in adults."

At a meeting of the Lambton County Medical Society held at Petrolia, on September 25th, Dr. C. H. Hair, of Toronto, gave a talk on "Surgical diagnosis in the genito-urinary system."

The Bruce County Medical Society met at Walkerton on September 26th, when the following addresses

were given: Dr. D. E. Robertson, Toronto, "Fractures;" Dr. R. I. Harris, Toronto, "Kidney lesions in children."

Dr. A. H. W. Caulfeild, of Toronto, addressed a meeting of the Brant County Medical Society at Brantford on the evening of September 26th, his subject being "Chronic non-tuberculous pulmonary diseases."

At a meeting of the Sault Ste. Marie Medical Society held on September 27th, Dr. Geo. A. Campbell, of Ottawa, gave a talk on "Difficult cases in paediatrics."

The St. Thomas Medical Society met on the evening of September 27th, when Dr. D'Arcy Frawley, of Toronto, gave a talk on "Fever in the puerperium."

N. B. GWYN

MANITOBA

The Manitoba Sanatorium Board has acquired a substantial brick building at the corner of Bannatyne Avenue and Olivia Street, which will be converted into a tuberculosis clinic. A tunnel under Olivia Street will connect it with the Winnipeg General Hospital, from which heat and power will be supplied. The proximity of the building just acquired to the General Hospital and the Medical School will be a great asset.

In the absence of Premier Bracken in England it is expected that no decision of the University Site Committee will be reached before December.

The death on October 8th of Lady Schultz removed one of the few remaining links of the present with the troublous days of Fort Garry. In 1864 she came to the settlement at the junction of the Red and Assiniboine rivers where there were only twenty-seven houses. Soon afterward she married Dr. John Christian Schultz. In 1870, when her husband was imprisoned in Fort Garry, she accompanied him to prison and was successful in smuggling in to him a gimlet and pen-knife with which he managed to make his escape. After the Riel rebellion was put down Dr. Schultz

was M.P. for Lisgar, later Senator, and still later, Lieutenant-Governor of Manitoba for four years. It was during this period that he was knighted. In his later years Sir John suffered from ill health, the result of his extraordinary efforts during the rebellion, and Lady Schultz was a devoted nurse up to the time of his death. To "Women of the Red River," edited by Mr. W. J. Healy, Lady Schultz contributed reminiscences, but it is to be hoped that she has left material for memoirs of a critical period in Manitoba's history in which her distinguished husband played a stirring part.

At the meeting of the Scientific Club of Winnipeg, on October 15th, Dr. William Boyd presented a communication "Recent work on neuroglia and glial tumours."

Dr. C. A. Mackenzie, President of the Manitoba Medical Association, Dr. W. Harvey Smith, President-Elect of the British Medical Society, and Dr. J. E. Lehmann, all of Winnipeg, took part in the program.

ROSS MITCHELL

ALBERTA

The annual meeting of the College of Physicians and Surgeons of Alberta was held following one of the sessions of the Alberta Medical Association meeting. One of the questions of interest was the relationship of the medical profession to the school boards of the rural districts. The Council went on record on behalf of the profession that it would co-operate with all rural school districts in order to inaugurate a system of health inspection for rural school children throughout the province, equal to that so well rendered in the various schools in the different cities of Alberta. As legislation already provides for this type of school service, school boards need not await any further legal amendments, but may proceed at once to avail themselves of this service if they so desire.

Regarding the question of British reciprocity most of the provinces of Canada no longer accept certificates of British registration as passports to provincial registration. Alberta still retains this reciprocity and the Council decided to take no steps to alter the arrangement.

Undoubtedly we shall always have indigents with us, but the exact interpretation of what the term "indigent" means is open to doubt. The Act specifies one meaning, whilst a rural councillor states that the words "indigent" and "pauper" are synonymous. Recently, a councillor in one of the rural districts declared that "an indigent was a person who could not provide food and clothing for his

family." He therefore refused to assume payment for a hospital account because the man had a sack of meal and a blanket.

There has been much agitation in the City of Calgary concerning the present water supply, which derives its source from the Bow river, not far from Calgary, and from many points of view it is not at all satisfactory. A special meeting of the members of the Calgary Medical Society was held on September 24th to discuss the situation and the following resolution was adopted.

RESOLVED: that the members of the Calgary Medical Society strongly endorse the steps taken by the Mayor and Council of the City of Calgary to have a survey made by a competent engineer, who will report on the most feasible scheme to provide an adequate water supply for the City of Calgary.

That every means should be adopted to secure a supply of water free from contamination and pollution. If a site for a reservoir, and the right to construct it within the confines of the Dominion Forest Reserve, could be secured from the Dominion Government, and assurance be obtained from the government that the watershed draining into such reservoir would be perpetually held free from all industries, camp sites, and human habitations. That, if necessary, considerable sums of money should be expended to insure such freedom from contamination.

That as far as possible, and in the interests of safety, the water system should be so planned that

artificial means of purification would be rendered unnecessary and pollution from floods would be avoided.

Dr. J. B. Valentine, of Lougheed, has moved to Galahad, where there is a modern twenty-bed hospital under the administration of the Roman Catholic Sisters. There is also a hospital at Hardisty under the same management which is filling a long felt need for hospital accommodation. This latter hospital was only opened last February.

The hospital at Daysland is being enlarged, and will soon have accommodation for fifty patients. This will be of inestimable benefit to the surrounding district. This hospital was closed some time ago when the large hospital at Camrose was opened.

The extra-mural post-graduate tours arranged through the grant to the Canadian Medical Association with the Alberta Medical Association in co-operation, have become so increasingly interesting and popular that the towns of Wainwright and Viking are each urging claims to be included in the itinerary of lectures to be given in November.

Professor Alan C. Rankin, of the University of Alberta, gave a most instructive address to the members of the Calgary Medical Society on October 8th, on "Some of the infectious diseases of unknown origin" in which he dealt with those due to a filterable virus, including rabies, small-pox, acute anterior

poliomyelitis, Rocky Mountain spotted fever, yellow fever, trench fever, the Rous sarcoma of chickens and other like diseases. This address was a particularly interesting one.

The municipal hospital at Hanna has recently been enlarged so that it will accommodate more than twice the number of patients it did formerly. With the extensive additions, it is now a thoroughly modern up-to-date hospital, serving a large surrounding country district. This new addition was recently opened, when the Hon. George Hoadley, Minister of Health, and Dr. M. R. Bow Deputy-Minister of Health were present. This hospital was first opened in 1921 with accommodation for twenty-two patients; with the new addition there will be room for fifty-four patients.

Dr. T. W. Moore, of Mountain Park, has given up his contract with the coal-miners at this place, and Dr. A. C. Greenway, of Killam, has been appointed as his successor.

Dr. J. J. Dubay, of Gadsby, has taken over the practice of Dr. A. C. Greenway at Killam.

Dr. J. G. Middlemas, of Wainwright, and Dr. G. N. Mayres, of Galahad, have formed a partnership.

Dr. Rosedale, a recent graduate of Alberta University, is now an interne on the staff of the Henry Ford Hospital in Detroit.
G. E. LEARMONTH

BRITISH COLUMBIA

Dr. E. L. Garner, of Duncan, left on September 19th on an extended trip to eastern centres. During Dr. Garner's absence Dr. Murray Baird, recently of the staff of the Vancouver General Hospital, is assisting Dr. G. D. Bissett.

Deep sympathy is being expressed for Dr. and Mrs. C. S. McKee, of Vancouver, whose son George lost his life on September 22nd while piloting an airplane over Lake Manitoba.

Dr. G. C. Paine is associated with Dr. R. B. White of Penticton, B.C.

Dr. R. G. Large, of Port Simpson, spent a holiday during the month of September, his practice being cared for by Dr. A. W. McCordick of Vancouver, B.C.

Dr. Gordon James, late of Vancouver, is now assistant to Dr. H. R. Learoyd, of Anyox, B.C.

Dr. A. P. Proctor, Jr., formerly of Penticton, is now associated with Dr. O. G. Ingham at Nanaimo, B.C.

Recent out of town visitors to Vancouver included Dr. D. W. Davis, of Kimberly; Dr. C. M. Willoughby, of Kamloops; Dr. A. K. Connolly, of Williams Lake; and Dr. J. F. Haszard, of Trail.

Dr. E. Seldom, of Vancouver, paid a visit to the east during September.

Dr. J. G. Robertson is joining Dr. J. G. Mackay as assistant.

Dr. Walter Graham has resigned his position at Sandon and intends to practise in Vancouver, B.C.

Dr. J. C. Grimson, of Ladner, is at present on a holiday, and Dr. R. B. Shaw is acting as his locum tenens.

Attention is drawn to recent amendments to the Coroner's Act of British Columbia. The fees for inquests and autopsies have been materially increased. These amendments are the result of representations made to the government by the British Columbia Medical Association.
C. H. BASTIN

UNITED STATES

Infant Mortality in the United States

A copy of the Statistical Report on Infant Mortality for 1928, issued by the American Child Health Association, contains much of importance. The following points may be noted.

1. The infant death rate is 68.3 for the 719 cities of the Birth Registration Area.

2. Last year's rate was 64.9 for 683 cities then in the area.

3. The 1928 rate is, next to the 1927 rate, the lowest ever achieved.

4. The baby death rate to-day is two-thirds what it was fifteen years ago.

5. "The United States is fast approaching the time when it may know its own birth and death rates." When a rate was quoted for the United States in 1915 it reflected only the figures from 10 states and the District of Columbia which then constituted the Birth Registration Area. In 1928, 44 states and the District are included. One more state was added in 1929, leaving but three states now with unacceptable records.

6. For the population group over 250,000, the cities with lowest rates were Seattle, Wash., and Portland, Ore., 43; San Francisco, 46.

7. Population group 100,000 to 250,000: lowest rates, Oakland, Cal., 47; Spokane, Wash., 49; Des Moines, Iowa, and Cambridge, Mass., 53.

8. Population group 50,000 to 100,000: lowest rates Berkeley, Cal., 31; Union City, N.J., 32; Long Beach, Cal., 38.

9. Population group 25,000 to 50,000: lowest rates Alameda, Cal., 25; Medford, Mass., 30; Oak Park, Ill., and Everett, Mass., 31.

10. Population group 10,000 to 25,000: lowest rates, Holland, Mich., 21; Braintree, Mass., 22; Stonington, Conn., 24.

11. The source of these records is the provisional reports of the United States Census Bureau and state and local authorities.

12. "Presence or absence of institutions, state of wealth, family customs characteristic of different race and nationality groups, knowledge and probably climate, each has an unquestioned part in determining the size of the infant mortality rate and these influences must be reckoned with as well as the thoroughness of the prenatal and infant welfare programs."

13. "As a metre of public health progress, contributed to from various channels, the infant mortality rate is most serviceable as an index of trend from year to year within the same city."

14. Among 10 large cities of the country New York has improved its relative standing of 3rd in 1916-1920, to 1st in 1925-1928. Philadelphia has advanced from 7th place to 5th place; Cleveland from 4th to 2nd. Boston has retired from 5th to 9th place, St. Louis from 2nd to 4th, and Los Angeles from 1st to 3rd.

15. "Wide acquaintance with the facts is believed to be one of the surest ways of accelerating a nationwide effort toward reducing the death rate among our babies."

The George David Stewart Endowment for Surgery

The University of New York announces the receipt of \$1,000,000 from George F. Baker, New York City, for the establishment of a fund to be known as the George David Stewart Endowment for surgery. The profession in Nova Scotia will be delighted to learn that this young school teacher from Malagash has received such a splendid recognition of his forty years' career in surgery in New York City. A striking feature of the incident is its illustration of the personal confidence and friendship, with ideals of life based on sound character, of the chief heads in the fields of medicine and finance. George Baker, the financier, and George Stewart, the surgeon, are two men we do well to honour.

William Crawford Gorgas

October 3rd commemorated the 75th anniversary of the birthday of one of the great chevaliers of medical science—William Crawford Gorgas, physician, sanitarian, and army officer, who freed Havana and the Panama Canal Zone of yellow fever.

The Gorgas Memorial Institute, with headquarters at 1331 G Street, N.W., Washington, D.C., founded to honour the name and achievements of Dr. Gorgas, announces that during the past year the two-fold purpose of Gorgas, Health Education and Research, has been carried forward in an active program which has benefited directly and indirectly the profession of which he was a member.

The program of Health Education has been accomplished through several mediums: the press, the speaking platform, the radio and through high school essay contests. Many physicians have aided in the per-

formance of this great task. Some have written health stories in terms of lay English, which have been released through the regular publicity channels of the Institute; some have assisted the Speakers' Bureau of the Gorgas Headquarters in arranging opportunities for the caravan health speakers; some have written medical articles for radio release, and a few have been of material assistance in bringing the high school essay contest, conducted during the past year, to the attention of the schools of their respective cities.

Health Corps have been organized in 72 cities, 40 newspapers have been added to the Gorgas syndicate, 3,830 health posters stressing the importance of the periodic health examination have been distributed and displayed, 5 special radio talks have been made in addition to the regular weekly radio health talk which is made over 22 of the leading stations of the country, and a special health film has received 55 showings to an estimated total audience of 29,243. A field program of this size has been made possible largely through the generous financial contribution of the Metropolitan Life Insurance Company.

The research work of the Memorial has been given an added impetus through the gift by the Government of Panama of a beautiful edifice which houses the laboratory in Panama. The 70th Congress of the United States made an annual appropriation of \$50,000 for the maintenance of this laboratory and Latin-American countries will contribute a *pro rata* share on the basis of population to the support of this project. Dr. Herbert C. Clark, a noted scientist, formerly of the United Fruit Company, assumed his duties as Director of the laboratory on January 1st. A Consulting Board from each Latin-American country co-operating will be appointed by the respective governments to aid Dr. Clark in his work. The Gorgas Memorial Laboratory will point the way toward better personal health from the place where the one whom it honours performed a miracle of science by making practical application of the Walter Reed theory of the transmission of yellow fever. The nations represented in the enterprise are banded together as brothers to make war on the scourges of disease. While they do not always see eye to eye on questions of international politics, in the name of Gorgas they are in this undertaking as an agency of welfare, and therefore an agency of greater efficiency and happiness for the human race.

President Hoover is the Honorary President of the Institute and Vice-President Charles Curtis is a member of its Board. At the last annual meeting held in Boston, Rear-Admiral Cary T. Grayson, "Physician to Presidents," was elected the active President of the Institute and Dr. Franklin Martin, President of the American College of Surgeons, was elected Chairman of the Board. Dr. Bowman C. Crowell of Chicago was appointed Chairman of the Scientific Board which will direct the policies of the Laboratory. Outstanding physicians, dentists, scientists and statesmen comprise the board, and an Advisory Council is composed of members of the Diplomatic Corps of the various Latin-American countries.

The great work of this organization will be carried on with renewed effort during the coming year. It is the duty and privilege of the medical and dental professions to co-operate, not only because of the ultimate benefit to these professions themselves, but because of the crying need of a campaign of this sort for the better personal health of our people everywhere. In this way can the deeds of a great man live after him, his most fitting monument.

The Committee on the Cost of Medical Care

In the United States, in 1928, a committee was organized to study the economic aspects of the care

German Statistics-on Tuberculosis

The April number of the bulletin of the International Union Against Tuberculosis gives for 1926 a general death rate of 1.168 per 100,000; tuberculosis all forms 98 per 100,000. Their highest tuberculosis death rate is for the ages 15-30 years. Males have a rate of

1.216 compared with females of 1.123 for all causes, but the tuberculosis death rate is 98 and 97 respectively.

Germany reports 1,988 dispensaries operating for the tuberculous and 29,661 sanatorium beds available for pulmonary cases, 2,323 for other forms of tuberculosis, and 19,587 beds available for any form of tuberculosis. Germany's population served is given as 62,866,000.

Book Reviews

Surgical Diseases of the Thyroid Gland. E. M. Eberts, M.D., Surgeon to the Montreal General Hospital, and Associate Professor of Surgery, McGill University. With the assistance of R. R. Fitzgerald, M.D., and Philip G. Silver, M.D. 48 engravings. Lea & Febiger, Philadelphia, 1929.

In this small octavo volume of 238 pages, Dr. Eberts has presented the profession with a very valuable monograph on a most important subject; a subject presenting many complex problems regarding which a voluminous literature has accumulated during recent years. The monograph represents the knowledge and practical results obtained from an unusually large experience in the Goitre Clinic of the Montreal General Hospital, and the final opinions of the writer as modified by an intensive study of the experience and writings of others on both sides of the Atlantic.

To quote from the foreword of Dr. Edward Archibald, Director of the Surgical Clinic of McGill University, there is not only room in medical literature for such a book, but there is a real need. In it one finds set forth, in concise and yet clear and descriptive diction, the knowledge gained from a careful and complete study, both at the bedside and in the laboratory, of more than 2,000 cases of disease of the thyroid gland; together with the results of treatment, in which a careful watch was kept on the patients for one or more years after discharge from the hospital.

The contents are divided into two parts. The first part describes the embryology, histology, physiology and pathology of the gland. The numerous illustrations are excellent and are all original. The second part is entirely clinical and includes chapters on Juvenile or Adolescent Goitre, Graves' Disease, Iodine Thyrotoxicosis, Adenomatous disease both toxic and non-toxic, and on the several inflammatory conditions of the gland. The descriptions of the various forms of thyroid disease are clear and concise. Treatment, both clinical and surgical, is fully discussed, and brief case reports add to the clarity of the presentation.

Long discussions on the yet unsolved problems of etiology are avoided, and while the views of other writers are briefly stated the personal experiences and views of the writer are definitely presented. In reference to Graves' disease Dr. Eberts gives it as his opinion that, while incipient cases may be cured by rest in bed and the administration of iodine, experience has shown that patients with a well established syndrome are rarely restored to normal health by these measures; on resumption of normal life or in the event of any subsequent infection, they are very liable to develop a return of the symptoms in an aggravated form. The final results in his clinic appear to prove that operation offers to these patients the surest hope of recovery.

This volume can be recommended as a clear presentation of our present knowledge of the diseases of the thyroid gland and will prove a useful guide book for the student, general practitioner, and busy practical surgeon, everyone of whom can consult its pages with profit and with the pleasure always connected with reading of facts and opinions well considered and well expressed.

A. D. BLACKADER

Trauma, Disease, Compensation. A. J. Fraser, M.D. Pages 516. Price \$6.50. Toronto: Macmillan Co. of Canada, 1929.

To those who are interested in the legal side of medicine, and more particularly in the operation of Workmen's Compensation laws, perplexing questions often arise in connection with the gradual merging of accident into disease. It is generally admitted that compensation for industrial accidents is fairly chargeable to the operating cost of industry; but often an accident, normally trivial, initiates a condition of considerable gravity. It is true that an employer is not responsible for one of his men having latent tuberculosis or syphilis; but neither is he responsible for a defective casting in one of his machines. Injury to the latter may produce a serious break, and injury to a sub-standard individual may activate a process which without the injury would have remained quiescent. Dr. Fraser has conceived the unique idea of writing a book on the subject of "the influence of trauma giving rise to subsequent conditions of disease." If you wish to know the relationship of syphilis, tuberculosis, cancer or any other disease to trauma and compensation you will find it in this book.

The work is largely made up of quotations from medical authorities and from records of various Workmen's Compensation Commissions. Injury and diseases of the various systems are treated chapter by chapter, beginning with the nervous system, and proceeding through the circulatory and gastro-intestinal to all the other systems. In order to miss nothing the author appears sometimes to go unnecessarily deeply into the subject, and lesions are mentioned which have no conceivable connection with accidental injury. For example, a page is devoted to blepharitis, and another to herpes zoster ophthalmicus and episcleritis, but no connection is traced between these diseases and industrial trauma. On the other hand such conditions as hernia and silicosis, which are constant thorns in the sides of Workmen's Compensation Commissioners, are discussed more briefly than their importance in compensation work appears to warrant. However, these criticisms are not very serious.

There is in this book a mine of information, which heretofore has not been readily accessible to the medical profession. The perplexed compensation commissioner or referee may also find much to guide him in his decisions. Dr. Fraser has wisely selected authorities who occupy prominent positions in their various fields, and has drawn most of his material from standard text-books rather than periodicals.

The printing is good and the index comprehensive. This book should fill a very definite place in the medico-legal field.

FRANK G. PEDLEY

Diseases of the Chest and the Principles of Physical Diagnosis. G. W. Norris and H. R. M. Landis. Fourth edition, revised. 954 pages, profusely illustrated. Publishers: W. B. Saunders, Philadelphia, McAnish & Co., Toronto, 1929.

Fears are sometimes expressed that clinical methods of examination are being discarded in favour

of laboratory and mechanical aids. The apprehension that this may occur is not unfounded, for these auxiliary aids are becoming steadily more and more accurate, within their limits, and the temptation to regard them as infallible is the harder to resist. Another reason is that the clinical method, which must always demand powers of steady attention, of observation, and of reason (quite apart from the indefinable "clinical sense," which is so strong and unerring in some and so entirely lacking in others who yet may have all the other qualities in the highest degree) will always be hard to master. No single acquirement in medicine is more difficult of attainment than accurate percussion, and next to it is that of translating auscultatory observations. And even when these are mastered the diagnosis is by no means always complete. It is little wonder that the x-ray or the electrocardiograph with their confident, clear cut statements, are so apt to be regarded as the final or even the sole court of appeal. The lazy will therefore always depend chiefly on mechanical aids, and in most cases they will serve him with perfect satisfaction. Even he, however, if he ever felt the higher satisfaction that attends the practice of an art, will sometimes appreciate the joy of diagnosis by means of his own capacities.

Books such as the volume under review will appeal strongly to those who wish to perfect their own powers of diagnosis, and to refresh their memory regarding the principles on which the various methods of examination are based. The best part of the book is that concerned with physical diagnosis. No effort has been spared to make it complete and the printing and illustrations are so very good as to make an immediately favourable impression. Special attention has been given to that difficult subject, the acoustics of the chest, and the chapter by Dr. Montgomery on transmission of sounds through the chest is valuable, though not easy reading.

It is a pity that not more care was taken in the proof reading. Misprints occur frequently; that of "mucous" when "mucus" is clearly meant being especially irritating. Proper names, too, suffer considerably. These mistakes will probably be attended to in the later editions which the book will certainly pass through, for it is a sound and satisfactory work.

H. E. MACDERMOT

An Index of Symptomatology. Edited by H. Letheby Tidy, M.A., M.D., F.R.C.P. 710 pages, 130 illustrations. Price \$12.00. Bristol, John Wright & Sons. Toronto, Macmillan Co. of Canada, 1929.

This volume makes the fourth in Wright's Index series in medicine and surgery, the others being the well known volumes on Differential Diagnosis by French, Treatment by Hutchison and Sherren, and Prognosis by A. Rendle Short. The editor contributes more extensively than those associated with him. He has a corps of outstanding physicians and surgeons who write on subjects with which they are particularly conversant, with the result that the work should represent the last word in the symptomatology of disease as taught in British medicine. The subjects presented cover the general range of medicine, surgery, gynaecology, and the various specialized lines of practice. We shall not attempt to give the list of contributors—they are all outstanding men in English hospitals and medical schools, teachers and writers. An attempt has been made to give a clear and concise account of the symptomatology of medical and surgical diseases, without unduly stressing complications and variations. Written in the form of an index, diseases appear in alphabetical order and not classified as in the usual text-book of systematic medicine. To include all diseases, medical and surgical, in one volume has forced the editor to make the descriptions concise, and bring out only the most important features of each.

It includes the more usual conditions met with in practice and provides a ready reference book, not an exhaustive treatise on each subject. As such it should find a ready welcome. In another edition we should like to see more reference to industrial and occupational diseases, and in a condition such as asthma more detailed reference to etiology, treating the asthma as a symptom, the cause of which must be found if satisfactory therapy is to be instituted. The book is a splendid companion volume to its predecessors in the series.

J. H. ELLIOTT

Rickets, Including Osteomalacia and Tetany. Alfred F. Hess, Clinical Professor of Pediatrics, University and Bellevue Hospital Medical College, New York. 485 pages, 52 illustrations. Price \$5.50. Lea and Febiger, Philadelphia, 1929.

This volume is a monument to the industry of the author, both as an individual research worker and clinical observer and as a student of the literature on these subjects. As he states in the preface, "It is realized that our knowledge of rickets is far from complete, and that new and important discoveries of various aspects, particularly in regard to pathogenesis, may be made in the not far distant future. But so much has been accomplished in the past decade and so remarkable has been the change in our clinical and scientific point of view, that the time seemed ripe to garner the harvest without waiting for additional crops." As a review of the recent literature on the subjects discussed, the labour accomplished is amazing.

The book is an attempt to assemble our existing knowledge—clinical, experimental and metabolic—garnered from the literature of the past ten years of the pathology, symptomatology, and therapeutics of these diseases, and while there is nothing included in the volume which has not been previously published, it does fulfil the object of bringing into a small compass all that is known of these three disorders. Much of it is a critical review of the literature, amplified by illustrative cases from the author's remarkable experience in the clinical study of rickets.

The chapter on osteomalacia shows the probable relationship of this disorder to rickets, and suggests that, though this disease may be refractory to cod liver oil, it should be amenable to irradiated ergosterol. Tetany is thoroughly covered, the literature critically reviewed, and methods of treatment outlined. The therapeutics of rickets, prophylactic and curative, in view of our newer knowledge, is discussed in the last chapter.

The book is well arranged, not too voluminous, and the ideas clearly expressed. It has, however, the misfortune that it is printed on very smooth paper, consequently causing fatigue in reading.

R. R. STRUTHERS

Tuberculin in Practice, Its Value in the Treatment of Early Tuberculosis and Asthma. F. E. Gunter, D.S.O., M.D. 102 pages. Price 7/6 net. The Gregg Publishing Co., London, W.C.2, 1928.

In a short review of the history of tuberculin the author says "a dogged perseverance has satisfied a few that tuberculin when properly used is of value in the diagnosis and treatment of tuberculosis."

He shows that when the diagnosis is made in the symptomatic stage before the disease is established at the apices of the lung, in cases without fever or marked emaciation, this method of treatment proves an efficient substitute for the sanatorium in many cases, and a useful addition in others. He must have been able to diagnose his cases very early indeed, as only 48 per cent of these showed physical signs in the lungs. In addition to symptoms he depends for diagnosis on a modified cutaneous test, using high dilutions of tuberculin, and upon x-ray examination. Dr. Hernaman-Johnson, on the other hand, in an excellent chapter on

x-ray and tuberculosis says "the first stages of the disease must inevitably elude x-ray examination."

Having first selected his cases, pre-eminently hypersensitive cases, without actual pulmonary disease, he proceeds to describe his method of treatment. Commencing with a liniment containing tuberculin he goes on to intramuscular injection of doses graduated to avoid reactions. The few illustrative cases, perhaps owing to insufficiency of detail, leave the present reviewer unconvinced as to the efficacy of this method of treatment.

This book is a fair presentation, for the beginner, of the case for tuberculin in diagnosis and treatment.

D. B. MENDEL

Principles and Practice of Electrocardiography. Carl J. Wiggers, M.D., Professor of Physiology, Western Reserve University, Cleveland. 226 pages, illustrated. \$8.00. St. Louis: The C. V. Mosby Company; Toronto, McAinsh & Co. Limited, 1929.

Canadian practitioners and specialists will welcome this simple yet comprehensive book covering the use of the various models of the Einthoven string galvanometer. The second part analyses the normal electrocardiographic deflections and correlates them with the physiological cardiac action. This is followed by the effects of abnormal mechanism on heart tracings. The terminology commonly used, without which the practitioner suffers a serious handicap, is described in a lucid and concise manner. The time relations of the variations showing auricular and ventricular activity are explained, beginning with the preliminary P, denoting the auricular complex to the final T, where ventricular activity ceases. Chapter VIII deals with the principles and theory of the causes of monophasic and diphasic currents, and the calculation of electrical axes.

The real value of the book to the practitioner lies in the careful study of abnormal deflections and complexes, viz., alteration of the P wave, aberrant QRS complexes, complexes of bundle branch and arborization block and T wave abnormalities. Ten pages are devoted to irregular heart action, for which electrocardiography is the method par excellence. Extra systoles (so common in practice) are explained, together with their differentiation from the more serious irregularities. There are chapters covering description of records and diagnosis and treatment for each of the following subjects, viz., the tachycardias, bradycardia and nodal rhythm, auricular flutter and fibrillation, hypertrophies and associated simple arrhythmias. Last, but not least, there is an illuminating chapter on "The electrocardiogram in coronary disease," so important in modern medicine.

The whole book reflects the twelve years' experience of a teacher of practical courses as well as a master in the workings of most of the electrocardiographic apparatus in use to-day. The book deserves a place on the bookshelf of every up-to-date physician.

C. R. BOURNE

Orthopaedic Surgery. Sir Robert Jones, Bart., K.B.E., C.B., Ch.M., F.R.C.S., F.A.C.S., and Robert W. Lovett, M.D., F.A.C.S. Second edition revised. 807 pages, 792 illustrations. Price \$11.00. Wm. Wood & Co., New York, 1929.

This is a beautiful volume of 800 pages. It is profusely illustrated and interestingly written. There are so many additions to, and changes from, the text of the edition of five years ago that attention is necessarily directed to only a few of them. The section on stiffness of joints gives, for instance, a very full description of Volkmann's ischaemic paralysis. Under Arthritis deformans, more attention is paid to operative treatment in developmental as well as adult

bone affections. The subject matter is discussed fully. Kolodny's classification of bone tumours is preferred to that of Codman, as being more easily remembered by the student. Under scoliosis there is given, though apparently not quite up-to-date, the treatment by the twin-buckle jacket, as well as that of Galeazzi of Milan. The indications for fixed operations in the spine are interestingly given. Vascular lesions of the extremities, such as thrombo-angiitis obliterans and Raynaud's disease, are described with Brown and Henderson's classification. Entirely new chapters or sections have been written on osteomyelitis, affections of tendons, muscles and fasciae (with much on the treatment of the infected hand), peripheral nerve injuries and their operative treatment, as well as amputations and artificial limbs.

Much more attention has been paid to backache and spondylitis than to fractures of the spine. Fractures of the extremities are well described, both the fresh and those showing mal-union and non-union. The subject of "claw-foot," missing in the previous volume, is here described in full.

The book reflects the greatest credit on Sir Robert Jones and his staff of collaborators. The orthopaedic profession generally will take pride in it. Its international character is reflected here and there in the conservative estimate given to procedures dear to the heart of clinics on this side of the Atlantic. Views of the Boston schools are given somewhat more widely than those of New York.

This is a splendid book which the reviewer finds it difficult to lay down.

J. A. NUTTER

Diseases and Deformities of the Spine and Thorax. Arthur Steindler, M.D., F.A.C.S. 573 pages, 76 plates. Price \$13.50. St. Louis, C. V. Mosby Co.; Toronto, McAinsh & Co., 1929.

A book written by a Professor of Orthopaedic Surgery, on Diseases and Deformities of the Spine and Thorax, should receive a very generous welcome. So few of us are orthopaedic-wise; so few of us have orthopaedic judgment; but so many have an orthopaedic conscience. Steindler has given us a book which is a departure from the usual plan of medical literature, and on which he should be congratulated. He states that medicine is never light reading, nor does he intend to give us an easily readable book. He has dispensed with the gravy and given us all meat.

The book is composed of ten chapters, and each chapter is in the nature of a monograph. In order, he discusses Congenital deformities of the spine; the Static and static-constitutional antero-posterior deformities of the spine; Scoliosis; Low back pain; Tuberculosis of the spine; Osteo-myelitis of the spine; Syphilis of the spine; Chronic arthritis of the spine; Tumours of the spine; and lastly, a Synopsis of the anatomy of the spine.

A reading of the last chapter would be helpful before beginning the book, in order to freshen one's knowledge of the anatomy. Each chapter is supported by excellent plates. The x-ray pictures are especially good and are well placed in the book.

The author has reviewed the literature on orthopaedics very completely, and the book shows careful presentation of every statement. He has refrained from dogmatizing in discussing therapeutic methods. He reveals opposing opinions frankly, but does not leave one in doubt as to which is the proper procedure. As the author states, "when the object of the treatment is fully explained and the salient points of the technique are given, obvious and self-evident details of technique can often be spared the reader who is expected to be conversant with general surgical routine." Steindler therefore has dispensed with the finer details of treatment. He hopes to create in the mind of the general practitioner that orthopaedic con-



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science stressed by Sir Robert Jones. This book will be a great help to the general practitioner as well as to the surgeon, more especially to the country practitioner, who sees the case for the first time, and who has to send the case to the nearest city for orthopaedic treatment.

H. M. YOUNG

Osteomyelitis and Compound Fractures. H. Winnett Orr, M.D., F.A.C.S. 208 pages, illustrated. Price \$5.00. St. Louis, C. V. Mosby Co.; Toronto, McInsh & Co., 1929.

This monograph, if so it may be called, consists of about 208 pages, and is an extended dissertation on the so-called "Orr Method" of treating infected and potentially infected wounds. The printer's work is satisfactory; the x-ray illustrations and the photographs of the author's cases, and of others, are fairly good. There are numerous case histories, too numerous for a book, and the continuity of the presentation is seriously impaired by this and the author's wide-a-field Chapter I on "Sir Joseph Lister and Antisepsis."

After reading the volume through I turned to page nineteen of the introduction by John Ridlon, and considered that the following paragraph—John Ridlon's—was what the book was all about! "Do an operation that will insure free drainage, drainage without rubber tubes, or gauze wicks or other drains. Make a wound that will drain itself. Cover the raw surface of bone and flesh with a smooth and un-irritating dressing (vaseline gauze), with enough pressure to insure healthy granulations. Rest the entire wound by a plaster cast that will immobilize the joint below and the joint above the wound. Then observe the patient—not the wound alone."

The second division can be of no great general interest, as it is largely made up of United States Army correspondence, papers, reports, and the author's adverse criticism of the Carrell-Dakin method and Williams' mobilization method of treating infected joints.

The chapter on osteomyelitis is the best in the book, and clearly demonstrates the method of "saucerization" of the area of bone disease, its packing by vaseline gauze wide open, covered smoothly by the same dressing, its padding and the encasing of the limb entirely in plaster of Paris, and leaving it alone for two, four or more weeks, unless evidence of acute sepsis occurs. The illustrations of "fixed traction" by moleskin strips turned back over the plaster while the limb is in extension, or by ice tongs imbedded in the cast, are clear, and offer a practical method of controlling position and extension during or after removal from the operating table. More than fifty pages are devoted to "Clinical Results" and afford a very tiresome way of converting surgeons to the "Orr Creed."

On the whole the book will appeal chiefly to those who deal mostly in emergency surgery of the extremities, and it is by no means a classic on this particular branch.

C. K. P. HENRY

Surgical Diseases of Children. S. W. Kelley, M.D., LL.D., F.A.C.S. Two volumes, 1374 pages. Price \$17.00. St. Louis, C. V. Mosby Co. Toronto, McInsh & Co., 1929.

The systematic order of this work makes it easy to read and easy to look up any subject in regard to the surgery of children. One cannot entirely separate surgical pædiatrics from medical pædiatrics, and the author wisely does not attempt this. The examination of the child, the signs and symptoms of disease, are well taken up, and the surgical treatment given, at times only sketchily. There is no attempt to give a detailed, comprehensive, description of the operative procedures necessary—the work is not an operative

surgery for children. The surgical steps are indicated and the author leaves to the surgeon the technique of the actual operation. On the other hand, non-operative surgical treatment is clearly and concisely described, for example, the treatment of burns, where the tannic acid treatment of Davidson receives adequate space and detailed description.

The chapters on acute disease of bone and tuberculosis of bone are adequate, and yet one wonders why tuberculosis of the spine is not included here. Fractures and dislocations are discussed very briefly in general, and clearly in detail, for each bone, with the various varieties of fracture. Splints and methods of treatment are well illustrated. Less than a page of reading and three illustrations dismiss Hodgkin's disease and no mention is made of the recent work of Wallhauser and Whitehead with gland extracts.

It is remarkable that the author dismisses tonsillectomy with a description of his own method of dissection and removal by a wire snare, not even mentioning the Sluder operation, while devoting several pages and illustrations to an obsolete method of tonsillectomy.

The surgery of the gastro-intestinal tract in children is so much like that of the adult that one need only comment on the surgery of diseases peculiar to children, as pyloric stenosis, intussusception, megacolon, etc. These are well handled, and the article on appendicitis in children is very aptly written indeed. Throughout the whole work there is considerable space given to congenital deformities, malformations, and various anomalies. The surgical treatment is clearly indicated, and is especially comprehensive in the various varieties of imperforate anus. This is of special value to the surgical pædiatrician, as in many of the surgical systems these conditions are not minutely described nor is the treatment given with enough detail.

The author's method of adhesive strapping for hare lip immediately after birth is well illustrated and should be known to all practitioners. It pulls together the bony cleft and makes so much easier and more successful the subsequent operation of lip suture (cheiloplasty). The illustrations and the text are remarkably easy to follow and are unusually good. Even the after dressing of silk gauze with collodion over it offers a decided advantage over that commonly used.

The two volumes will be of great value to the general practitioner who has to do most of his own surgery, as well as to the operating surgeon who is not doing a great deal of surgery on children and infants. To the pædiatrician and the teacher it makes the best work available for reference, and will fill the gaps so frequently found in the larger systems of surgery. As it is now in its third edition the demand for a work of this kind must be widespread. It is thoroughly recommended and the author is to be commended for such an excellent work.

C. K. P. HENRY

The Treatment of Fractures. Lorenz Bohler, M.D. Translated from the German by M. E. Steinberg, M.S., M.D. 185 pages, 234 illustrations. Wilhelm Maudrich, Publisher, Vienna, 1929.

This work, originally in German, has been translated into English by Steinberg and makes a compact volume of some 185 pages. The text is divided into two parts, general and special. The general part deals with general principles and management, fundamental laws, and treatment. In the author's work, local anaesthesia has entirely displaced general anaesthesia during reduction.

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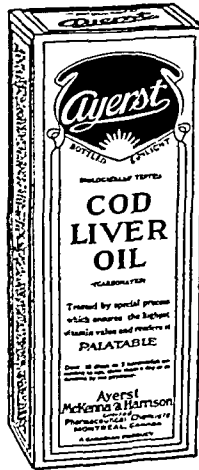
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how to do it. The book has every appearance of being of real value to those engaged in fracture work.

R. V. B. SHIER

Some Principles of Minor Surgery. Zachary Cope, M.S., M.D., F.R.C.S. 159 pages, illustrated. Price \$3.25. London and Toronto, Oxford University Press. McAinsh & Co., Toronto, 1929.

As stated by the author in the preface, this book is not an attempt to cover the wide field of minor surgery, but rather to stress elementary principles, more particularly for the reading of post-graduates. The outstanding feature of the work is the chapter on infections of the hand, which amounts to a summary of the teaching of Kanavel. In this chapter several superimposed drawings are used to excellent advantage. Altogether, this is a valuable book on the subject of minor surgery.

R. V. B. SHIER

Surgical Pathology. Cecil P. G. Wakeley, F.R.C.S., F.R.S., Hunterian Professor, Royal College of Surgeons, England, and St. J. D. Buxton, M.B., B.S., F.R.C.S., Junior Surgeon, King's College Hospital. 904 pages, 392 illustrations. Bristol, John Wright & Sons. Toronto, Macmillan Co., 1929.

This Surgical Pathology is really an acquisition, not only for students but surgeons also. Inflammation and gangrene are discussed in a very enlightening manner. Tumours are well described and both gross and microscopic pathology fully discussed. Surgical tuberculosis is well covered as are also the non-tuberculous arthritides. Intracranial tumours are discussed so far as the general surgeon is concerned. The pathology of the nose, throat and larynx is concisely reviewed. The pathology of the gastro-intestinal tract is well written and the illustrations are very instructive. The final chapters concerning genito-urinary pathology are comprehensive and well illustrated. The book is well written throughout, the paper is excellent, the print clear, and the whole is a credit to any publishing house.

R. B. MALCOLM

The Autonomic Nervous System. Albert Kuntz, Ph.D., M.D. 576 pages, 70 illustrations. Price . . . Lea & Febiger, Philadelphia, 1929.

From this work one is able to visualize the autonomic nervous system as an intrinsic whole, with its relationship and its distribution definitely established. The ganglion cells and their connections are well described; the centres in the central nervous system are clarified; the general physiological action and interaction with the endocrine glands are specially dealt with. One is carried back to the development of the autonomic nervous system and sees relationships which are of paramount importance.

In other chapters the author takes up particular systems with reference to their autonomic innervation, paying special attention to the heart, the blood-vessels, the respiratory system, the urinary system, the sex glands, the eye and the skeletal muscles, and he gives a comprehensive survey of the physiological action. In the final chapters, the general pathological alterations are attended to with special reference to the histological changes, referred pain, vagotonia, and sympatheticotonia. Finally, opinions are given as to the relationship of the autonomic nervous system to some phenomena in disease, such as the correlation of some endocrine disturbances, the explanation of reflex disorders of the digestive tracts, gastric and duodenal ulcers, and many other abnormalities.

Probably the most enlightening chapter is the last, when the author discusses the pros and cons for surgery of the autonomic nervous system in such conditions as spastic paralysis, in diseases of the blood-vessels, in angina pectoris, in bronchial asthma, in

Hirschsprung's disease, in hyperhidrosis and in visceral pain. This chapter is worth careful study, because it gathers concisely the recent trends of this particular aspect. A complete bibliography is included, which adds considerably to the value of this book in offering an up-to-date treatise on the autonomic nervous system. There is no better book in the English language on the subject.

A. W. YOUNG

The Nose, Throat and Ear and Their Diseases. Edited by Chevalier Jackson, M.D., Sc.D., LL.D., F.A.C.S. and George Morrison Coates, A.B., M.D., F.A.C.S. 1177 pages, 657 illustrations. Price \$13.00. London & Philadelphia, W. B. Saunders Co.; Toronto, McAinsh & Co., 1929.

This work consists of original contributions by some 70 American and European authors. Besides the editors, others of special note are, Sir StClair Thomson of London, and Logan Turner of Edinburgh, while it will be a satisfaction to Canadians to find Birkett of Montreal entrusted with an extensive contribution. Several Parisians are also included.

The book is divided into four parts—the Nose, the Pharynx and Naso-Pharynx, the Ear, and the Larynx. In each the anatomy is carefully and concisely considered with the aid of adequate illustrations. Disease is dealt with under uniform headings and treatment is discussed with a consideration and lack of dogmatism, which is refreshing to the reader whom practice has taught the pitfalls of empiricism. In general, the description of operative technique is satisfactorily aided by excellent diagrams.

Of special interest is an article on tonsilloscopy. It opens with the remark, "The trend of the world's medical literature is strongly in opposition to the surgical practice which has been in vogue for a generation or more of enucleating the faucial tonsils without a positive knowledge of the existence of potential pathogens within those lymphoid organs." This newer method is based upon the art of trans illumination.

Birkett's chapters on the tonsils and tonsil operations contain a mine of information. The functional testing of hearing and the treatment of deafness will be found to be very fully covered, as also the diagnosis of intracranial complications from aural suppuration. There is a useful chapter also on anaesthesia in operations on nose, throat and ear. Diseases of the larynx occupy nearly 400 pages. Syphilis is dealt with by Logan Turner and Carcinoma by Sir StClair Thomson, while Chevalier Jackson writes on Endoscopy.

This book is intended primarily for the specialist, though it will prove valuable as a reference work for the general practitioner and the house surgeon. It embodies a real, and, we think successful, effort to produce a reflection of what is best in modern practice. There are more than 600 illustrations and a comprehensive index.

PERCY G. BELL

Manual of Diseases of the Nose, Throat, and Ear. E. B. Gleason, M.D., LL.D. Sixth edition, revised. 617 pages, illustrated. Price \$4.50. London & Philadelphia, W. B. Saunders Co. Toronto, McAinsh & Co., 1929.

This book made its first appearance in 1907 and has been revised numerous times and kept up to date, which is good evidence of the popularity this author's work has received.

In his own words the outstanding purpose for which his book was written is that it should be a manual "to supply students and general practitioners with the essential facts of rhinology, laryngology and otology." He has emphasized various treatments in sufficient detail to make them of practical value to the general practitioner. In it the specialist recog-

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nizes methods of treatment with which he is familiar and finds a variety from which to choose. The author's long experience in this specialty has well qualified him to express his views on results obtained.

A unique feature is found under "Formulas" at the end of the book. The action of the various drugs recommended is described in sufficient detail to give the reader an intelligent idea of their uses. This is very often omitted in larger books and has made the use of various drugs in the nose, throat and ear somewhat vague to those who are not observing frequently or have not large experience to draw upon. The sections on diagnosis, pathology, etc., are carefully dealt with, in sufficient detail to give a clear understanding of the problems mentioned, and the author has added numerous illustrations.

The book is distinctly valuable, more especially to the general practitioner, and one feels that the author has given his readers much interesting information.

H. H. BURNHAM

Roentgenology. The Borderlands of the Normal and Early Pathological in the Skiagram. Alban Kohler, Prof. Dr. med., Wiesbaden. Translated by Arthur Turnbull, M.A., B.Sc., M.B., Ch.B. 536 pages, 24 illustrations. Price \$12.00. Baillière, Tindall and Cox, London; Macmillan Co. of Canada, Toronto, 1928.

This classical work is indispensable to radiologists and to orthopaedic surgeons. It is an excellent translation from the fifth German edition by Dr. Arthur Turnbull. The translator has done his work admirably and although at times he has given a rather literal translation, it is a good fault. The ripe experience of the author shines through each page. He has added the leading references on each section, which makes the book still more useful. Dr. Kohler emphasizes his main object in the sub-title "The borderlands of the normal and early pathological in the skiagram." In this respect the volume is unique. The slight changes in bony structure are interpreted and pointed out in the clear line drawings taken from actual skiagrams. This method of illustration has much to commend it, as so much fine detail is lost in the reproduction of skiagrams on a small scale. In addition to the bony structures of the body, there are sections on the viscera.

J. BEATTIE

On Prescribing Physical Treatment. Matthew B. Ray, D.S.O., M.D. 179 pages, illustrated. Price 10/6 net. Wm. Heinemann, Ltd., London, 1929.

This work, as the name implies, is a moderately brief description of the subject of physio-therapy, with practically the whole emphasis laid on the matter of the prescribing of this form of treatment. The author, after a brief introduction, devotes a chapter to the elements of physio-therapy, i.e., the anatomy and physiology of the skin, other physiological considerations, effects of treatment, immediate and secondary reactions, etc. Then the various physical agencies are taken up, viz., light, heat, water, electricity, massage, etc. The general arrangement being: (1) a brief description; (2) physiological effects; (3) indications for their use in the treatment of diseases.

Physicians and surgeons who do not themselves practise physio-therapy, but who have occasion from time to time to refer their patients to non-medical but trained workers in this field will find in this book a most useful and complete guide to the prescribing of the particular type of physical treatment required.

NORMAN BROWN

Physical Therapeutic Technic. Frank Butler Granger, A.B., M.D. 417 pages, illustrated. Price \$7.00. London & Philadelphia, W. B. Saunders Co. Toronto, McAlinsh & Co., 1929.

In his preface the author states, "That this book has not been written for the specialist in physical therapy. . . . It is intended however, for the physician, who has installed a limited equipment. . . and who can undoubtedly do good in carefully selected cases." Twenty-five years' experience as therapist, as director of army physio-therapy, and as teacher of physical therapeutics, qualify the author to deal with his subject in a manner which should be of value, not only to the beginner, but to the specialist.

The earlier pages deal in a satisfactory manner with necessary physics, and the various currents used. The section on the electromagnetic spectrum and light therapy is carefully handled, as also the part devoted to diathermy. Hydro-therapy, massage, and the uses of carbon dioxide snow, receive concise treatment. Chapters 16 and 17 are devoted respectively to the requisites for adequate teaching of physio-therapy, and the establishment of a hospital physio-therapy department.

The book is, however, essentially clinical, and methods of treating those diseases which yield best to physical agents, comprise the major part of the book. Chapters 19 to 34 deal with such diseases, or group diseases, in detail, describing indications and contra-indications, with requisite technique. The much discussed non-surgical removal of tonsils is dealt with wisely, and in an unprejudiced manner.

The reader will find the chapter entitled "Index of disease", unique in the handling of therapeutic technique. Here is laid down a clear, concise, and practical table for the treating of those conditions for which physio-therapy is a treatment. This index is arranged alphabetically and is a very complete guide of treatment technique, and will be of great practical value to the physician using it.

"It goes without saying that physio-therapy should be prescribed only after a careful examination has been made, both physical and laboratory. . . . All therapeutics should be applied with brains." This quotation proves that the author appreciates the full meaning of treatment, and the physician who follows the author's technique in physical therapy will find much satisfaction both for himself and his patient.

L. R. HESS

Mechano Therapy. Mary Rees Mulliner, M.D. 265 pages, 57 illustrations. Lea & Febiger, Philadelphia, 1929.

The author has had a wide experience in teaching and practice, and is well qualified to write on the subject of massage and remedial gymnastics, for which she has used the somewhat unusual, though appropriate, title of "Mechano-therapy." Dr. Mulliner was formerly instructor in the Summer School at Harvard and in the Sargent School of Physical Education.

The book is written mainly for students, but will be found interesting and instructive by medical practitioners as well, especially those who practice physio-therapy. It is well illustrated and contains a very comprehensive bibliography, with brief comments on the books mentioned. Special features of the book are the chapters on relaxation and faults of posture.

F. W. HARVEY

A Manual of External Parasites. Henry Ellsworth Ewing. 225 pages, illustrated. Price \$4.50. Charles C. Thomas, Publisher, Springfield, 1929.

This book deals only with the five major groups of ectoparasites, the mites, ticks, biting lice, sucking lice, and fleas, with an added chapter on new genera of ectoparasites.

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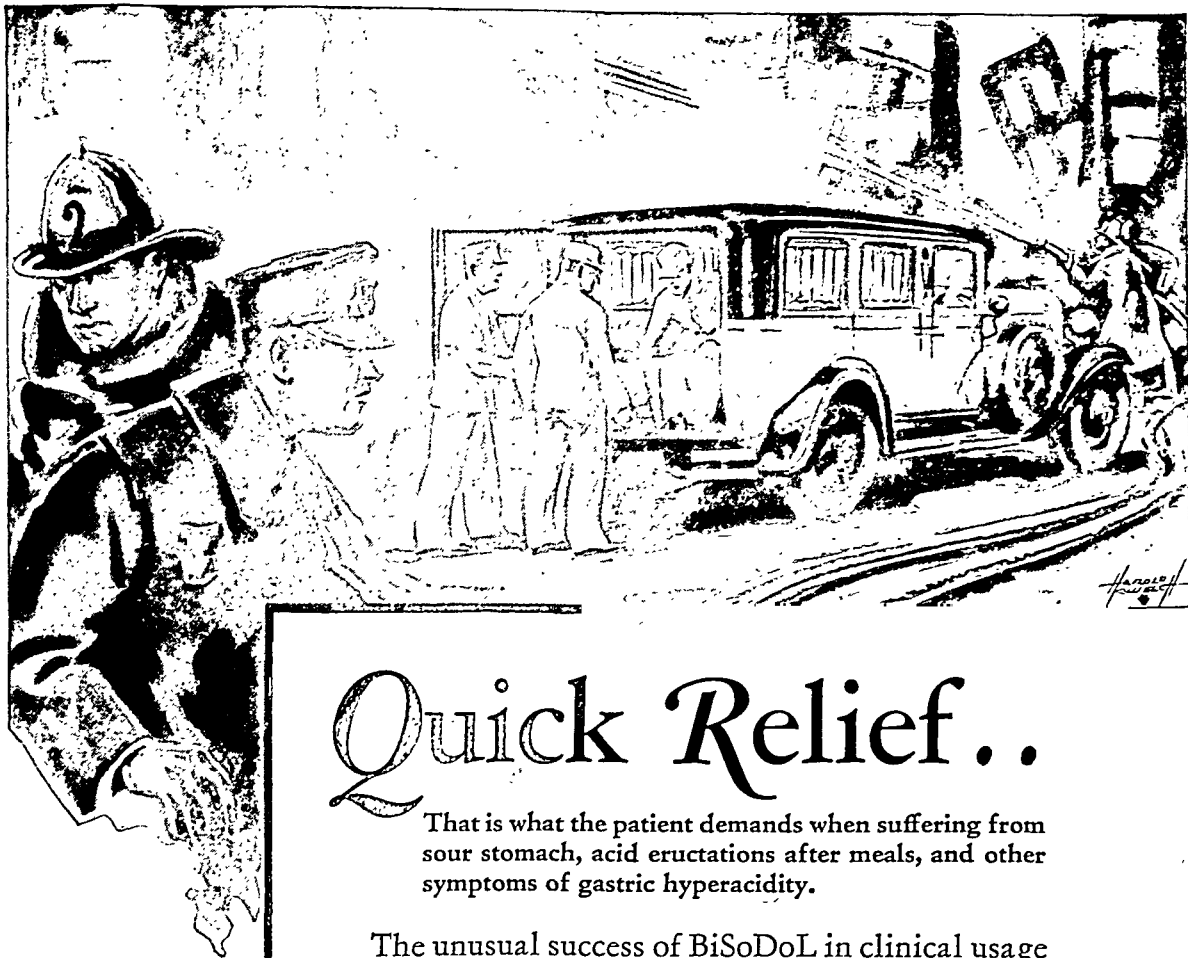
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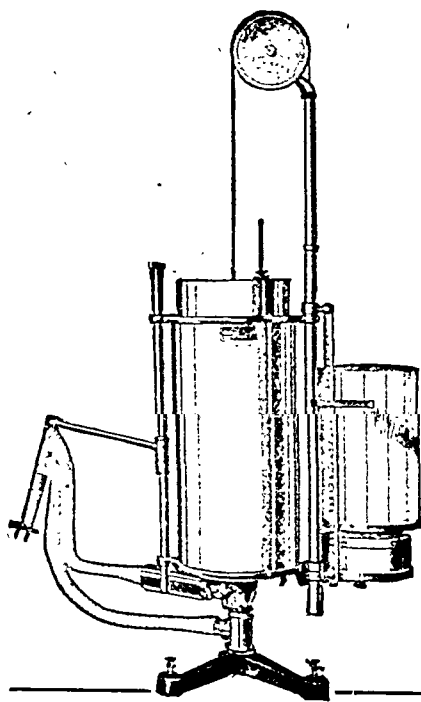
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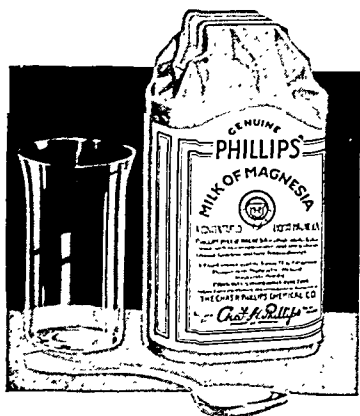
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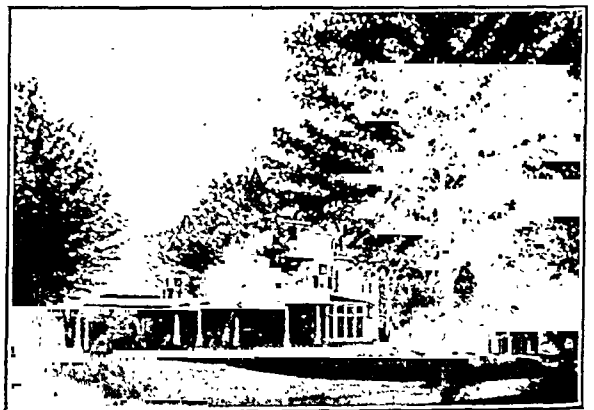
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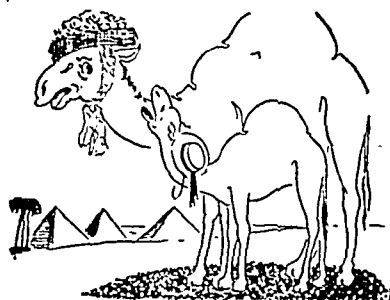
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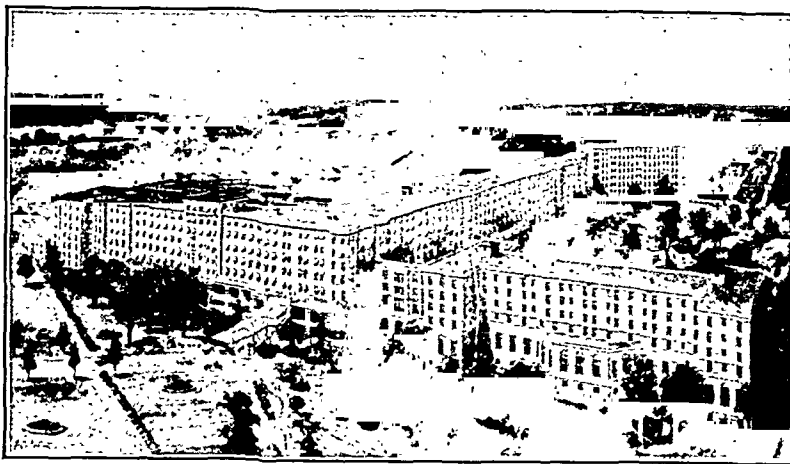
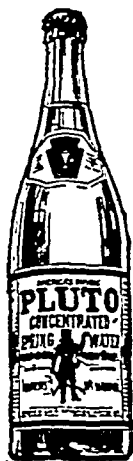
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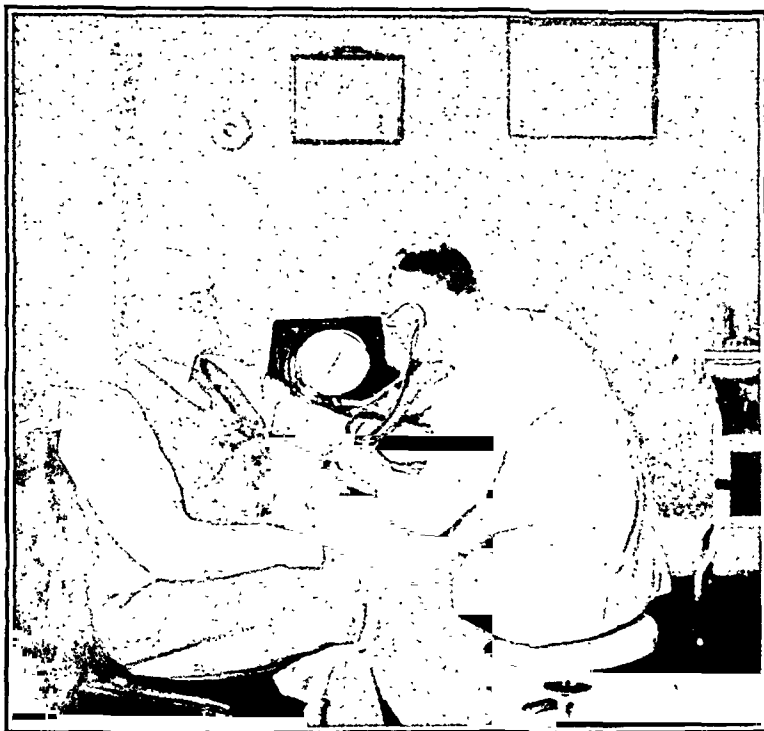
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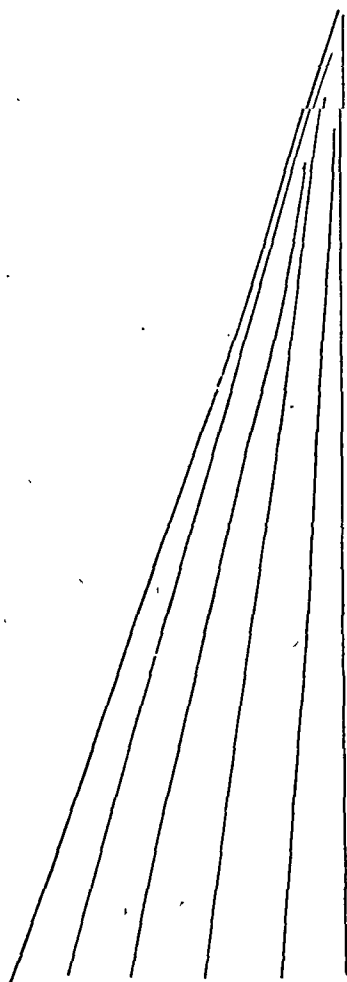
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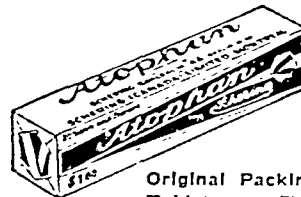
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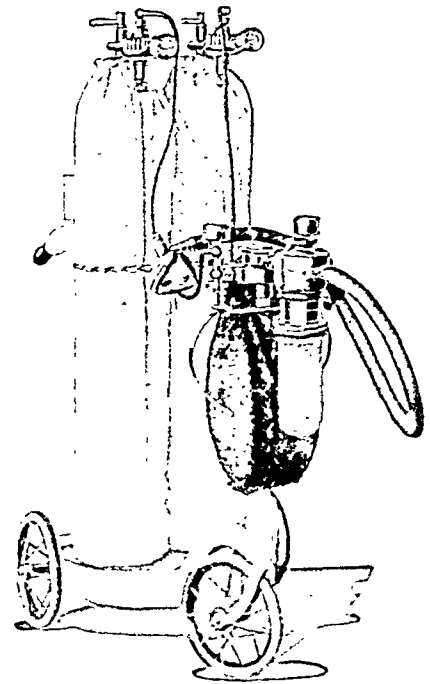
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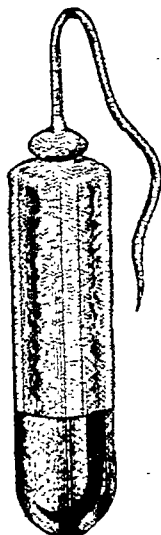


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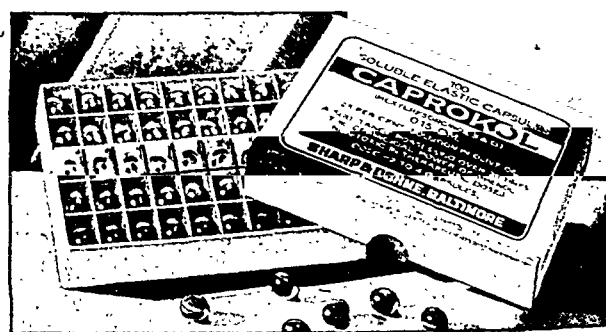
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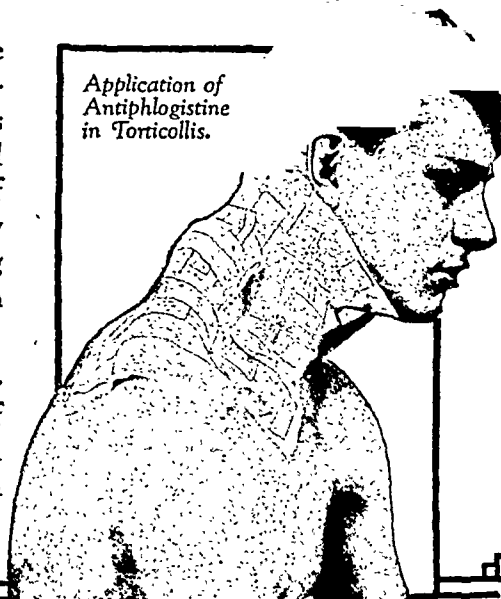
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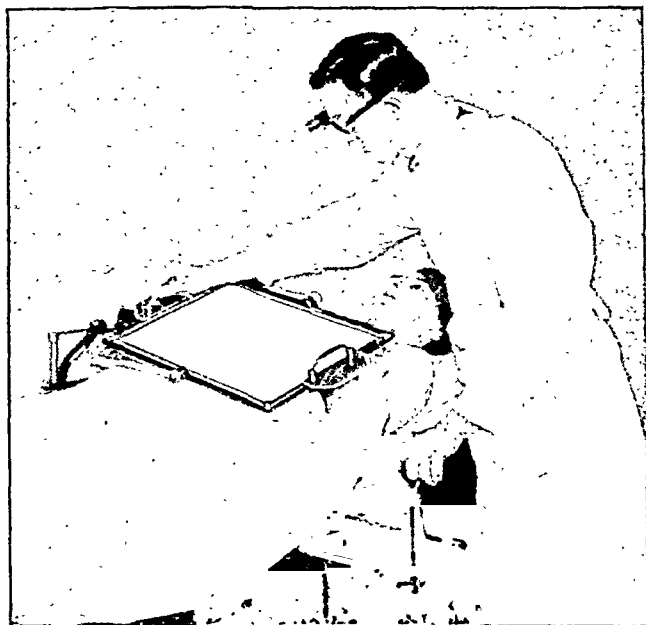
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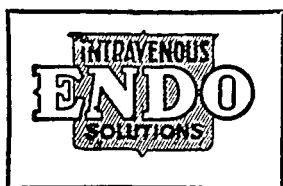
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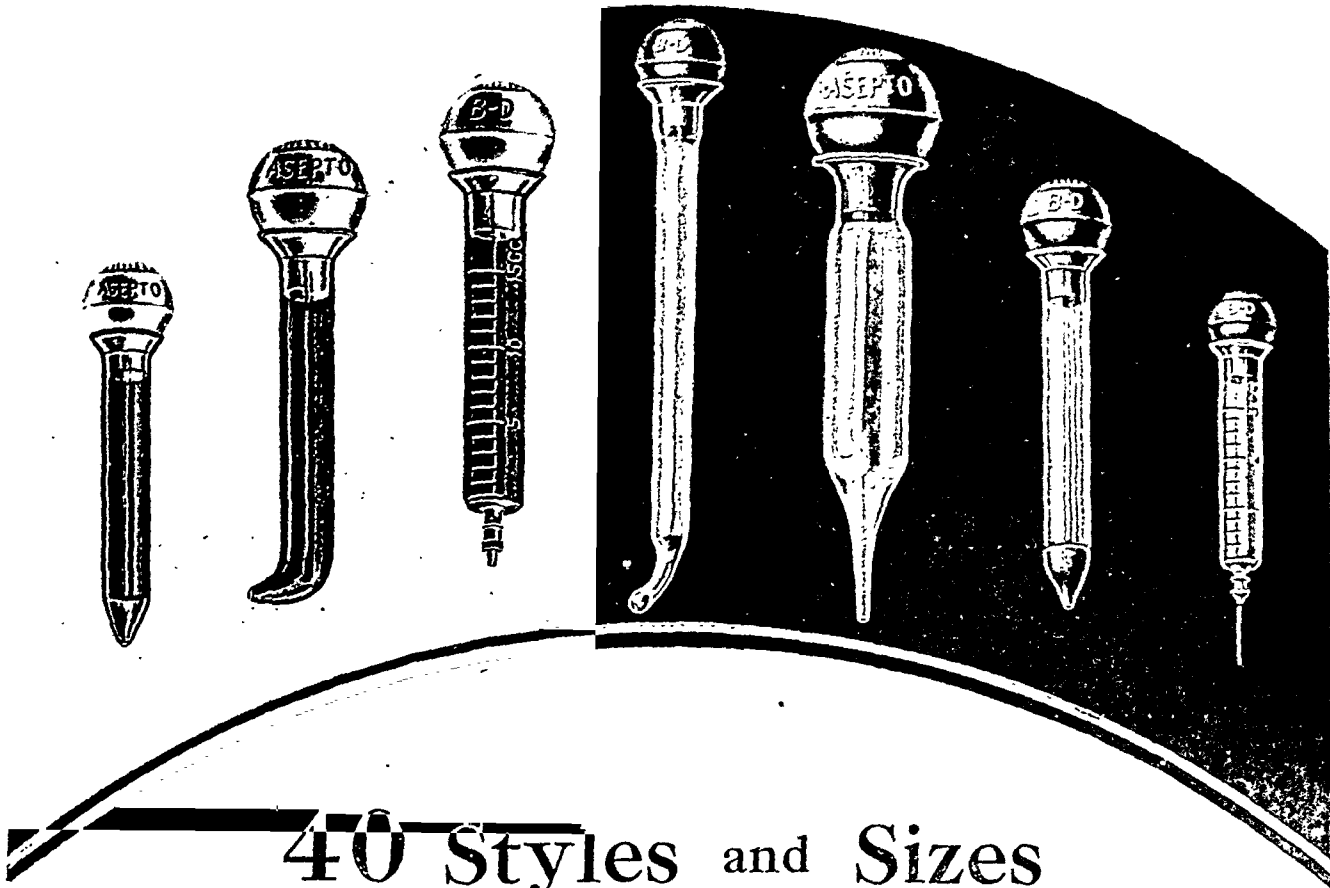
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Acting Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C.

3640 University Street, Montreal

Vol. XXI

OCTOBER, 1929

No. 4

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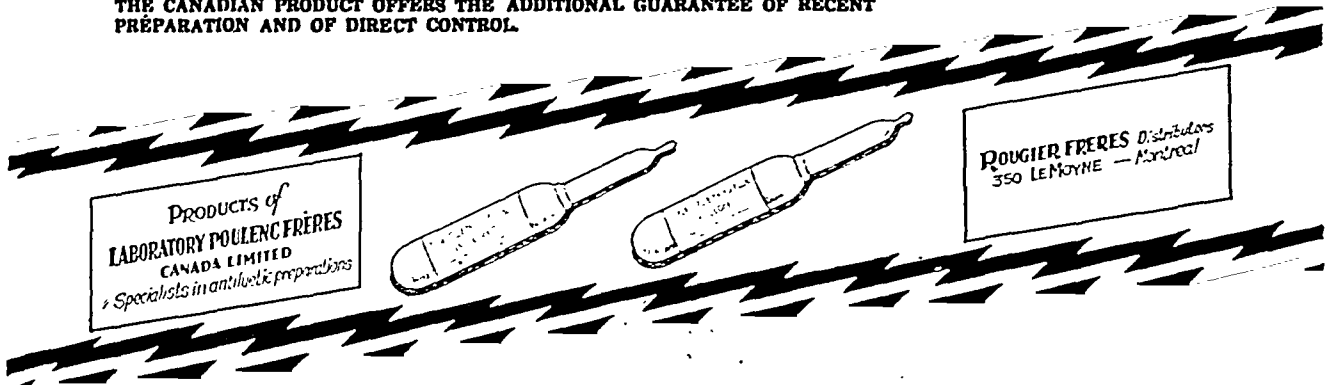
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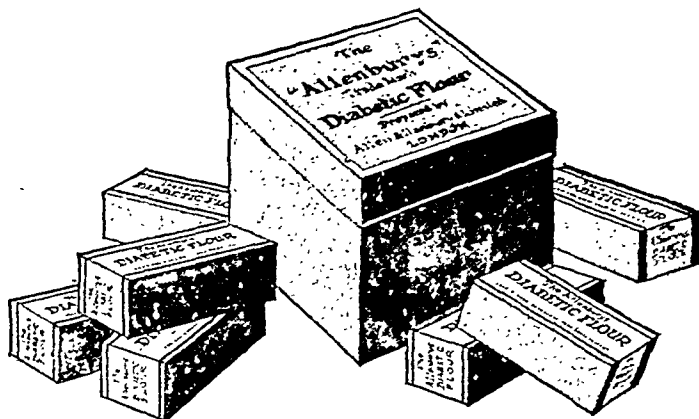
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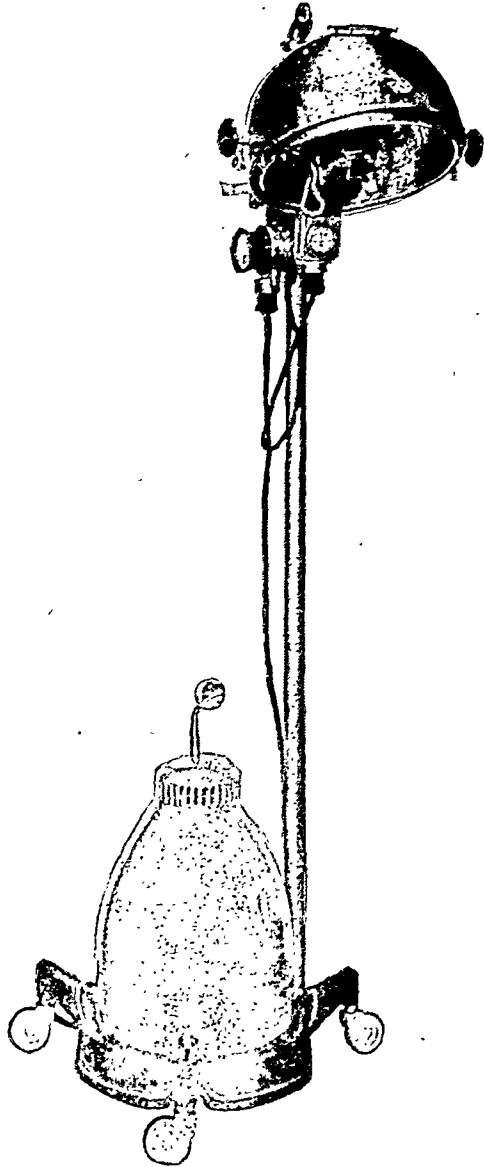
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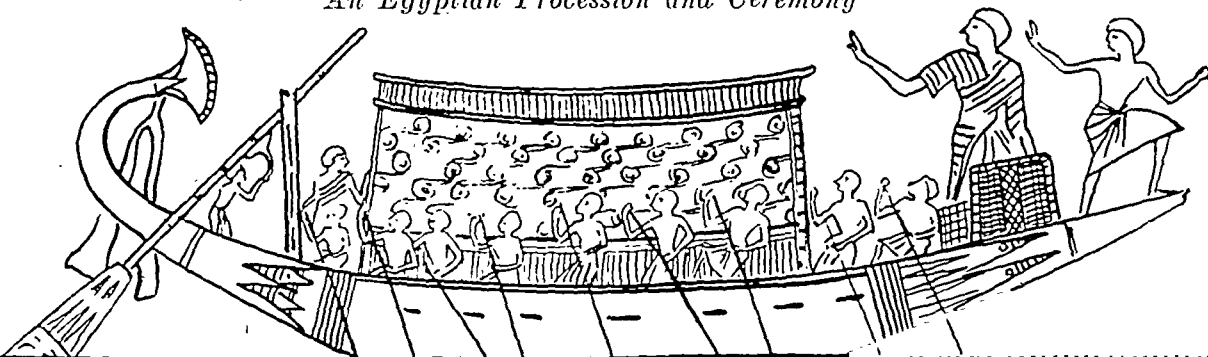
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The Canadian Medical Association Journal

Vol. XXI

TORONTO, OCTOBER, 1929

No. 4

DR. A. D. BLACKADER AND THE JOURNAL

WE are pleased to be able to present our readers, in this issue, with a portrait of Dr. Blackader, who has lately retired from the Editorship of the *Canadian Medical Association Journal*. The portrait is reproduced from an oil painting which hangs on the walls of the University Club of Montreal, by the well known artist, M. Alphonse Jongers, and will be recognized as an excellent likeness.

The Canadian Medical Association and its *Journal* owe much to Dr. Blackader. This obligation was appropriately and gracefully acknowledged last June, when it was announced that the Association had decided to establish a Blackader Lectureship in Pædiatrics. The *Journal* itself is a standing memorial also to his zeal and ability.

Medical journalism began in Canada about one hundred years ago, in the City of Quebec, and for many years maintained a precarious existence. Our *Journal* may be said, with considerable justice, to have derived its origin from *The Canadian Medical and Surgical Journal* which first appeared in 1872, under the editorship of Drs. Fenwick and Campbell. This periodical continued until 1888, when its name was changed to *The Montreal Medical Journal* and it came under the management of Drs. Ross, Roddick, and Stewart.

At the Annual Meeting of the Association at Toronto, in June, 1910, it was decided to establish an official journal "as a medium for the expression of all that is best in Canadian Medicine. For practitioners of general medicine, or in any special department of it; for workers in the laboratory or the hospital, a vehicle is offered which goes wide afield for the conveyance of fresh information, free comment, and sound opinion.

"It will be its aim to offer adequate means of publication, within the country, of material, some of which, at least, has hitherto been brought to the notice of the profession in English and foreign journals. If Canadian thought upon Medicine is to make that impression upon the world which its importance warrants, it must be concentrated in one channel. What that channel shall be remains for the thinkers themselves to decide." Sound ideas these.

The new magazine, *The Canadian Medical Association Journal*, appeared on January 1st, 1911, under the editorship of Dr. (later Sir Andrew) Macphail. An editorial in the first issue was at once a hope and a prophecy. "A Canadian type of nationality and a Canadian type of disease are in process of formation, and Canadian physicians are quietly and surely laying the foundations for a Canadian Medicine of the future. The Canadian Medical Association and its journal, by enlisting the sympathy, support, and co-operation of men from all parts of the Dominion, will help to lay this foundation broad and deep; and will do much to banish sectionalism and provincialism." The new *Journal* was formed by the amalgamation of the *Montreal Medical Journal* and the *Maritime Medical News*, the latter discontinuing publication at the end of 1911.

The course of the new journal was beset with difficulties from the first, chief of these being those resulting from the war. While the Editor, Sir Andrew Macphail, was away on active service the *Journal* was capably administered by Drs. Maude Abbott and Gordon Campbell. After the war Sir Andrew resigned and an Editorial Board was constituted, with Dr. A. D. Blackader as Chairman. This was in 1919. Difficulties with the publishers, which had become acute, were overcome by the purchase of their rights toward the end of the same year. Henceforth, the road was smoother. How the *Journal* has progressed under Dr. Blackader all are aware. The *Journal* took on a new lease of life after the historic meeting in Halifax in 1921, when the finances of the Association assumed a more promising aspect. This was the turning point, and the Association and its official organ have never looked back. The *Journal* was considerably enlarged in 1924, and by 1925 had doubled the number of its reading pages and increased their size. In 1926 it was so large that it had to be divided into two half yearly volumes. The ideals with which the *Journal* started have been well maintained, and none can fail to appreciate its steady growth throughout past years. Dr. Blackader's name is writ large not only on the pages of our *Journal* but in the history of medical journalism on this continent. A.G.N.

An Address

ON

THE DUTY OF THE DOCTOR TO THE HOSPITAL*

By H. H. MURPHY, M.D.,

Kamloops, B.C.

IN his history of the English people, John Richard Green states that James I—"the wisest fool in christendom"—was the originator of the theory of the Divine Right of Kings. In one of his famous addresses to the Star Chamber, James briefly stated the doctrine as follows:

"As it is atheism and blasphemy to dispute what God can do, so it is presumption and high contempt in a subject to dispute what a king can do, or to say that a King cannot do this or that." The church quickly approved of such a reasonable doctrine, and Oxford University soon followed suit.

Everyone knows the outcome of that struggle to determine whether civil power and authority was a divine gift at birth or was vested in the common people. But, just as we occasionally see a gill slit persisting in the human organism, recalling to mind our own past physical history, so we sometimes find, even in this age of democracy, groups who seem to claim the Sovereign Right Divine in their relationship with mankind at large. I would ask you to consider with me this afternoon the question of the doctor's duty to the hospital as impartially as we can, pausing now and then to consider if in our hospital work our viewpoint is ever that of James I.

It is recognized by every one that every hospital has one main function—to adequately care for the sick—and we realize that any hospital is founded on a rock which returns to health the largest possible percentage of its patients in the shortest possible time. This, of course, implies that every medical man occupying a position on a hospital staff must be qualified for the work he essays, and must keep abreast of the steady progress in medicine. It requires that every hospital practitioner must continue to be a student as well as a practitioner. Just here I wish to to acknowledge the indebtedness of the medical

profession of Canada to the Sun Life Assurance Co., to the Canadian Medical Association, and to Dr. Geo. Young, of Toronto, in providing a system of nation wide post-graduate medical addresses and lectures. In this matter we are engaged in pioneer work and the eyes of the whole medical world are following this daring, and, so-far, gloriously successful innovation.

Besides the main purpose of our hospitals to adequately care for the sick, some hospitals have other important functions. These are: (1) the training of physicians and nurses, (2) the health education of the community, (3) the advancement of medical knowledge.

To accomplish their main function—the adequate care of the sick—our hospitals, closed and open, are shouldering a steadily increasing financial burden, and there are those who think that in this matter of expense our profession has inherited somewhat of the viewpoint of James I, that as sovereign lords we are demanding an ever increasing hospital expenditure without much thought or consideration as to where the money is coming from, and with perhaps too kingly a disregard for economy in its expenditure.

When a hospital is built as a result of a private bequest, there is usually sufficient trained supervision of plans and construction that gross technical errors are avoided. But, when a community undertakes to provide such an institution, and the architect chosen is perhaps designing his first hospital, the results are not always so happy. We find waste space in corridors, doors through which hospital beds cannot be wheeled, kitchens so remote that it is impossible to serve meals warm without great expenditure for special containers and carriages—in short, hospitals that are designed without any thought for saving time and energy in the actual nursing care of the sick. These things you have all seen. In the majority of cases, the medical profession, supposed to be interested, have been consulted,

* Read at the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, June, 1929.

but through lack of special training, perhaps even through lack of interest, our profession, as a whole, has not given the help to lay boards in these matters that it was reasonable to expect. An ill designed and cheaply constructed hospital will function poorly and expensively throughout its life. I believe that through the hospital department of the Canadian Medical Association, under Dr. Harvey Agnew, we will find the help and trained knowledge and accumulated experience which will remove this reproach from amongst us. I believe that such a department will prevent not only errors of the type I have mentioned, but will also act as a brake on those hospitals' ambitions which sometimes lose sight of the primary object—the care of the sick—in the materialization of the finest, best, and most expensive building of its kind yet undertaken in the community.

Having built our hospital, have we as a profession any further responsibility to it beyond the skilful, energetic, and sympathetic care of our patients? I believe we have. We must develop what Dr. Joseph C. Doane, of the Philadelphia General Hospital, calls "hospital mindedness."

We all, I think, at one time or another complain of the extravagance of the professional nurse. And, yet, where has she developed her habits of prodigality? From you and from me, since she has graduated from our hospitals. The carelessness of the attending staff with catgut and dressings, gauze and glass syringes, and biological products, is translated in every hospital into a debit entry of thousands of dollars every year. Nay more, its effect on the morale of a training school for nurses and a post-graduate school for young physicians is incalculable. "There's such divinity doth hedge a king." "Hospital mindedness" means the same thought, the same care and thrift in the use of hospital supplies as each one of us show in his own office. If leniency is to be shown to any, it is to those who are giving lavishly of their time in the charity wards, where they may perhaps sacrifice material to save time, but these men would probably consider such a dispensation as more of an insult than a privilege, for it is "their" hospital and they value their hospital connection and association.

You must remember that the hospital expenditure of this country runs into many millions of

dollars each year and this fund is expended directly or indirectly by our profession. We decide what cases require hospitalization; we decide on the duration of the stay of each individual patient, and the medicine, food, and dressings used during their hospital stay. There is no suggestion in any quarter that the primary function of our hospitals—the adequate care of the sick—should be allowed to suffer in any way, but there is now a section of organized public opinion which is beginning to question our divine right in hospital matters. I refer to the Compensation Boards in our various provinces. They can say, and do not hesitate to say to us, "This case may and this case may not be hospitalized, and you must explain why this case was hospitalized for so long a part of his disability." In other words, whenever we keep a compensation board patient in hospital beyond the period we can justify to the Board there is a direct financial loss to our hospitals, because the patient does not feel that this is an affair of his. If this is true to-day, how necessary it is that we should recognize our responsibility, because to-morrow, or a decade hence, some measure of health insurance will be in operation in some sections or all of Canada, and your responsibility and mine to our hospitals in these financial matters will be an even more vital matter than it is to-day. Furthermore, a hospital staff co-operating in these household economies will, I am sure, find co-operation and assistance from the Board of Management in hospital development. They will find that through this co-operation they can direct and advise our hospital extension, changes and replacements, and, furthermore, no hospital staff that concerns itself with hospital costs, be it maintenance or construction, but will find its advice eagerly sought and carefully weighed.

When each month, or each year, our Boards of Management ask our co-operation in husbanding the economic resources of our hospitals, I claim that we can never again join James I in proclaiming that "it is presumption and high contempt in a subject to dispute what a king can do, or to say that a king cannot do this or that." The Stuarts have demonstrated the folly of this line of reasoning.

Another function of our hospital staff is health education of the community. The hospital should not only be the community centre for

healing but the community centre for health. The hospital staff, adequately and sympathetically caring for the sick, has already the willing ear of the community in dealing with the doctrine of health, or disease prevention. Throughout the length and breadth of the land there is a very real and insistent demand on the part of the general public for health education. Volunteer organizations, such as the Red Cross and various public health societies, have recognized this need and are now actively meeting much of this demand. Only a small part of these activities are under the direct supervision of the medical profession, though it was to us that the general public looked originally and still look for this teaching. They accept it when it comes with the approval of the medical profession, and it is our own fault that we have so largely lost this excellent opportunity for contact with mankind in general. A splendid work is being done by our Post-Graduate Committee in sending out whenever possible, with each team, a member of our own association competent to give a public address on some phase of health education. I know from experience that in the smaller communities these addresses are extremely popular and are doing a great deal of good, both for the public and our own profession. The term 'doctor', as you all know, originally meant teacher and in so far as we are neglecting this primary duty, in so far as we are failing to achieve an easy victory. In just that degree are we losing the understanding, sympathy, and support of the general public, and in just so far are we opening the way for healing sects and cults and ill-advised public legislation.

Our responsibility to our community in connection with research requires no further notice. The physicians in any community who appreciate their opportunities as teachers, both within and without their hospitals, will not lack enthusiasm for research, nor will they lack the funds for its materialization.

From this we pass on to the first mentioned of our ancillary hospital functions, the teaching and training of physicians and nurses. To-day I will deal only with the training of physicians.

While it is true that our laws wisely require that each student after graduation shall spend at least one year in hospital service as an interne, our hospital attending staffs have

perhaps been rather leisurely in recognizing the moral obligation of preceptorship which they assume when they install an interne staff.

The student beginning his internship has successfully completed many years of training which has been largely theoretical. He has had practical demonstration of what to do and how to do it. He knows how to take a good history, how to make a good physical examination, and his university teachers have certified him as fit to begin to carry responsibility. They have guaranteed him as worthy to begin his practical work in our guild under our supervision, and he comes to his first hospital appointment full of enthusiasm, loyalty, energy and good will, and, what is perhaps of almost equal importance, he has the idealism of youth and the sense of fair play developed in clinic lecture room and football field.

When the hospital Board agree to accept an interne, they morally agree to provide him with that practical experience to which he is now entitled; they covenant to allow him to do or to assist in doing, always under supervision, those procedures which he has learned about in an academic way; they promise that the year he spends as interne will be the most valuable experience he has yet had in fitting him for his active professional life. And the new interne looks to the attending staff of that hospital to materialize those covenants. In other words, the hospital, be it open or closed, which establishes an interne service automatically admits its responsibility as an educational centre. To the interne this teaching is to come through doing, and in no other way can a hospital staff justify this year spent under their supervision, for one cannot imagine a hospital giving a salary sufficient to justify a student in spending a year where he could not grow in soundness of thought, in directness of intuition, in development of judgment, as well as in deftness of touch and manual dexterity.

I have mentioned before that the student enters his hospital life capable of writing a good history, but he does not enjoy this routine detail work any more than you or I do, but he is glad to do it if his history is used in working up the case. If it is never looked at, if it is treated as of no value, you may be sure that the histories written at the close of his year's work will be of no value to himself or to any-

body else. On his histories, as on his other work, he will welcome constructive criticism, and he will grow under it. He wishes to make his own diagnosis and compare it with his chief's, and if he is wrong he is entitled to the time necessary to show him where his appraisal of clinical signs and symptoms was at fault. He welcomes mental growing pains, if he can be sure he is growing. He is not content to gain a so-called obstetrical experience by giving an anæsthetic, nor to scrub for an operative case, and have no more responsibility than to hold a retractor. He is not willing to answer night emergency calls from private patients whose case histories are not open to him and where he has not been allowed to make a physical examination. He has had a good training, and is not prepared to appear ridiculous in the eyes of either patient or nurse. Orders for patients he naturally expects will be given through him, and his chief should surely spare time to explain to him why a particular procedure is being carried out. If the case is obscure and a consultation is held surely he should be present. When the work of the hospital is reviewed at the regular staff meetings, he should be present and should be prepared to give his findings in the cases under discussion. He should be prepared to do this and should be asked to do it. He is entitled to help and direction in his medical reading, and he is entitled to library facilities to enable him to carefully study his cases. If in connection with some medico-legal case he is called into court as a witness, he has every reason to expect assistance and guidance from his chief, so that he may reflect credit on himself and on his profession. If he is going to spend a year in a general hospital he looks for a general practical training in the fundamentals, medicine, surgery, obstetrics, anæsthesia, and accident surgery. He hopes for some experience in some of the special fields, such as urology, eye, ear, nose and throat, and he is entitled to a competent diagnostic service of radiological and pathological laboratories.

More and more it is becoming necessary for our young medical graduates to seek internships in the so-called non-teaching hospitals, *i.e.*, hospitals not connected with any medical school. I do not believe that our profession in general have yet fully awakened to their responsibilities

in this matter. Their responsibilities! Nay, their opportunities! for no man can teach without learning himself; no man can discuss a case with his own interne without clarifying his own thought; and no hospital can embark on a course of tuition, be it for nurses or physicians, without very definitely improving the character of the work done in that institution, for here as elsewhere.

"More blest is he who gives than who receives
For he that gives doth always something get."

Your hospital is not entitled to an interne service because it has 100 or 1,000 beds always full, but it is entitled to that service if your medical staff are willing to have those cases properly studied under their supervision, and if they are willing and capable to teach from that clinical material. Willing and capable of teaching! How much is implied in those words?

"The teacher is more to be revered than even the father, for he is the father of the soul and mind, when the other may be but the father of the transitory body."

I believe that no man can attend our great Canadian French and English medical schools and not come under the influence of one or two great teachers; more than that scarcely any man can hope for. It is perhaps open to doubt if he could appreciate more than that. I believe they are in our teaching schools to-day, because I know personally that they were in McGill in my own student days, and I found another in my chief in the Episcopal hospital, Philadelphia. The teacher not only gives you knowledge in assimilable form, but he gives you interest, enthusiasm, breadth of view and develops your latent ability to weigh evidence. The interne who finds in his chief a personal ideal, as well as a clinician and teacher, will remember that year of training long after his academic years have become a hazy past. Such an experience will strike the tempo of his professional life. "For who shall number the years of remembrance." This year may well decide whether he will remain a student and perhaps retain some of his idealism throughout his professional life, or whether he will become mentally lazy and commercially acquisitive.

Any hospital and any hospital staff that is not prepared to give at least what I have outlined is not entitled to an interne staff. Do not think for one moment I am discussing

a purely academic problem. I can give you chapter and verse for every suggestion I have made to-day and this question is a vital one to every major hospital to-day. The time is not far distant when the hospital that is not worthy of an interne staff will either not have one or will pay handsomely for it. There are those who believe that the difficulty some Canadian hospitals are having to-day in securing internes (I quote here from a recent article in our own *Journal*) is because "Canadian graduates do not realize that Canadian hospitals offer them a course equal to that which they can obtain elsewhere." My point is that those hospitals which offer a course "as good as can be secured elsewhere" have no difficulty in securing internes, and that those hospitals which do not offer satisfactory interne service are probably better known to the members of our graduating classes than they are to the profession at large.

Your hospital is to-day appraised by the members of the final year in every medical school as a desirable or undesirable appointment, and you may depend that in the main your applicants will be largely what you yourself have asked for. In some countries students may appeal to the national medical organization for advice in this matter, and, I think, rightly so. This condition has arisen, not because it is a convenience to the student, but because the individual hospitals are anxious to be rated by the national body as offering desirable, efficient, and comprehensive interne service. If your hospital has had an interne service in the past, and you find difficulty in maintaining that staff, I would suggest that it is a serious reflection on your attending staff and on the standard of medicine in your community. It is not because your attending staff cannot teach; it is because they will not teach; it is because of selfishness or the taint of commercial acquisitiveness. Our hospital staffs, east and west, north and south, have had the required training, and with the increasing hospitalization of our population they have the material. Have they the inclination? If you want an interne staff, or a larger interne staff, and cannot secure it, I ask you to consider the problem fairly and ask yourself if you really deserve it, and, while pondering the matter, remember what Dr. Doane says in this connection: "if 'My interne', as spoken by the visiting physician with the accent on the pronoun, implies proprietary or servile relation-

ship, educate your chiefs. 'My' as used by a chief should mean his to instruct, his to tutor, to help in every educational phase of his hospital life."

Over and above all the material things necessary for each patient, over and above the careful appraisal of clinical signs and symptoms and the resulting appropriate treatment, have we any further duty in our daily work? In one of his delightful essays, Weir Mitchell wrote "but over and above all this there is, as I have urged, some mystery in the way in which certain men refresh their patients with their presence. I fancy that every doctor who has the power, and sooner or later he is sure to know that he has it, also learns that there are days when he has it not. It is in part a question of his physical state, at times virtue has gone out of him." This intangible healing power which comes so often through the laying-on of hands, whether in a benediction, or in percussion, this confidence of relief, has been articulate through the ages in the cry "If Thou wilt Thou canst make me whole." This reaching out for what, unfortunately, we cannot always offer, this continues, and will continue, in spite of the progress of the purely scientific side of medicine. Here, the physicians of the past personified the highest traditions of our art and part of our hospital duty lies clearly before us here. It can be delegated to no hospital social service; it is ours to do, to bring to each one that helpful sympathy, the genuine will to cure, which can be measured in no material way, and which perhaps is more needed in the delirious acceleration of to-day than it ever was in the past.

In conclusion, all of you, I am sure, feel as I do, that we have only partially considered this question. I believe that in the discussion to follow many points will be amplified and new ones added. You can each one of you think of important phases of the question, which I have only suggested. To those of you who feel that in most instances the spiritual is the real, and that, if we can follow the star of idealism, all material things will be added unto us, to those I would say, seek in Micah the 6th chapter and the 8th verse and you will find the spiritual guide for us all.

"What doth the Lord require of thee but to do justly, to love mercy, and to walk humbly with thy God."

An Address
ON
INDUSTRIAL HYGIENE AND THE MEDICAL PROFESSION*

BY WADE WRIGHT, M.D.,

Assistant Medical Director, Metropolitan Life Insurance Co.,

New York City, N.Y.

I AM most grateful for the honour of the invitation to address the Canadian Medical Association and for the privilege of discussing before you certain aspects of industrial hygiene.

Improbable as it may seem to many of you, I feel very certain that there is no subject of greater significance to Canadian medicine and to Canadian physicians than that of industrial hygiene. Canada, old in years, young in spirit, almost incredibly rich in natural resources, is facing an opportunity to develop a new social order. Canada possesses a wealth equalled by few nations, in her grain lands, her forests, her mines, and in her hydro-electric power. To supplement this material wealth, she brings that which is more precious still, the character and courage and vigour of two great peoples, now one, who have chosen, in their strength, to struggle with the wilderness and in it rear a mighty commonwealth where freedom of opportunity and social justice shall prevail.

It has been inevitable that first her sons should labour close to the earth, that they should find their livings in fields and forests and in ships. With the opening of her mines and with the development of her power resources, however, a new order must come, for where there is abundant and cheap power, industry will inevitably find its way. A nation dominantly agricultural will become, for better or worse, a nation dominantly industrial. It is for Canadians, and, in no small degree, for the Canadian medical profession, to determine the nature of the transition and whether or not the new order shall be a fortunate and a happy one.

Man lives by faith and love and labour. The work which men and women do, the conditions

under which that work is done, and the pay which they receive for doing it, determine in very great measure the economic and physical factors in their own lives and in the lives of those dependent upon them. The house in which a man and his family live, the clothes they wear, the food they eat, their schools and churches, and recreation are those made possible or necessary by the circumstances of employment.

It is perhaps no less obvious that capacity for labour in factory, office, forest or mine, is largely dependent upon physical competency. Ill health, whether totally incapacitating or not, must be reflected in lowered productive efficiency and ultimately in impaired earning power and discontent. Ill health, uncontrolled, inevitably leads to the curtailment of the working and earning period of life, to underemployment, and to dependency, if not indeed to premature death. Recent figures have shown that the expectation of life at age 20 of men not engaged in industry is 49 years; for those in industry it is 42 years. This reduction in expectancy of 7 years is a heavy price to pay for that which many leaders of industry would term "industrial progress." Furthermore, management unescapably shares with labour a large portion of the cost of industrial sickness.

Even those who are optimistic enough to believe that the span of life may be materially lengthened, a belief, incidentally, scarcely warranted by fact, would probably be reluctant to assert that the measurement of man's life should be limited to a single dimension. It is not unreasonable to consider the breadth and depth of life quite as worthy of extension as is its length.

Industrial hygiene is a term which connotes

* Delivered before The Canadian Medical Association, Montreal, June 19, 1929.

to many a department of medicine concerned essentially with such vagaries as rare poisonings and the illusive subtleties of dusts and ventilation. It is, in truth, on the contrary, as broad and varied in its implications as are the health problems of men and women who work. Industrial hygiene is the health of the worker and, in consequence, with the exception of those few unfortunates whose medical practice is exclusively among the lilies of the field, industrial medicine is part of the daily burden of all physicians, even of the pædiatricians—for that matter, especially of the pædiatricians, for children of workers will be the workers of the new day.

Industrial medicine is of concern to the medical profession generally, because it is the medical profession generally which must offer to an industrial population the technical guidance and care which it requires in matters pertaining to health. Physicians employed part time or full time in industrial or mercantile establishments, on railroads or by mines, unless they are found in remote and isolated communities, can do no more, should do no more, than render services in emergencies and, through continued vigilance in their supervision of the health of workers, direct those in need of remedial or corrective measures toward trustworthy medical resources.

All too often through misunderstandings on the part of private practitioners, or through selfishness or tactlessness on the part of plant physicians, irritation and difficulties have developed between the two groups. Such conflict is needless folly, for the functions of the two are not antagonistic but complementary. The industrial physician cannot accomplish his task without the private practitioner and good plant medical practice invariably leads to more and better medical practice in the industrial community.

Industrial hygiene, aside from a limited but important body of knowledge of specific occupational diseases, is not a thing apart, a thing of itself, to know or to write about or talk about. It is, rather, an avenue of approach to the health problems of a very large portion of the population. It involves the exercise of human interest which, once assumed, leads to a better grasp of the job to which the medical profession has set its hand.

In more practical terms, it concerns, for example, such matters as the identification of the dominant health problems in a community by cause, by age, by sex and occupation, conditions which unless identified can never be purposefully attacked. It makes possible the early recognition of disease as does no other mechanism in our social structure. It appeals to the skill and sympathy of physicians, to the end that the functional capacity of individuals be clearly recognized, that function be promptly restored after disease or injury, and that men and their jobs may be reasonably well adapted to each other.

The physician's lot is not always a happy one. He has been known to bewail, in the sanctity of the family hearthside, the stupidities of much of the work which constitutes his daily routine. He very often feels that he is unable to see or to grasp the essential factors involved in the causation of the physical ailments which are brought to him and that his function is largely palliative. He does his best, perhaps a little less, and saves his face behind the ancient cloak of mysticism worn by physicians since the dawn of time. Better things await the man of medicine.

Dealing as they do with successive individuals in office or in homes, the members of the medical profession have in great part developed habits of mind which render it peculiarly difficult for them to recognize the broader aspects and common factors in problems of health and disease. They have been inclined to leave these matters for that group on the fringe of the profession known as the public health authorities. As a matter of fact, the public has neither health nor disease. The public's health can be but the composite picture of the health of the individuals which constitute that public. The private practitioner, in spite of himself, is in reality the most important of public health officers.

Through the study of the causes of sickness and death in various groups of individuals, each relatively homogeneous, can there be gained much of the knowledge requisite as a basis for their control. Industrial and mercantile organizations afford the opportunity for such group studies, serving as laboratories and at the same time reaping the benefits of the research. Such studies are astonishingly il-

luminating. Consider, for example, the death rates for the several social classes published recently by the Registrar General of England and Wales, showing the progressive increase in mortality, as one passes from the highest social and economic level to the lowest. The death rates per 100,000 from respiratory tuberculosis are for the five social classes, respectively, 73, 126, 146, 150, and 209; for valvular heart disease they are 33, 52, 56, 62, and 74; for all causes of death, 743, 862, 870, 921, and 1,151.

A similar picture is portrayed in the mortality among the several classes of policy holders in the Metropolitan Life Insurance Company; low rates among Ordinary Policyholders, far higher rates among Industrial Policyholders, and intermediate rates among those of the intermediate class, covered by moderately small policies.

Mortality studies of various occupational groups disclose facts no less startling. Again do the excellent data of the Registrar-General reveal the appalling mortality from respiratory tuberculosis among such occupational groups as tin miners, grinders, slate masons and pottery workers, findings confirmed in insurance mortality records. Similar excessive occupational mortalities are reported for other causes of death. It is of passing interest that there is no important relation of occupation and deaths from heart disease.

If morbidity be considered instead of mortality, again do statistical studies present new visions of the work we have to do, with plentiful indications of where and when it should be done. The analysis of illness among industrial workers causing incapacity up to six months in duration has shown twice as great a loss from rheumatism as from respiratory tuberculosis and it can be localized by sex and age. It has shown appendicitis as almost as great an immediate problem as tuberculosis, and all digestive disorders combined, almost four times as great. Women have appendicitis at almost twice the rate prevailing among males. In one plant acute respiratory disease, such as pneumonia may be overwhelmingly predominant; in another, digestive disturbances; in another, arthritis. In one industry peritonitis was scores of times more prevalent than in all industries combined. There is a higher in-

cidence of neuritis than of organic heart disease.

Findings such as these await the physicians who are eager to watch the fireworks in display, who are not content to putter among the pathological burned out remains on the day following the celebration. The display is being held in any sizeable industrial group.

Physicians in industry, working with physicians in industrial communities, can, if they will, through their sustained contact with industrial workers, and particularly through the medium of routine physical examinations, detect disease in its early stages. This requires, it is true, an interest greater than most men possess in incipient and apparently trifling maladies. It requires more than the customary ritual in the laying on of hands and stethoscopes. It requires a willingness to listen to the plaint of the patient, for he has much to tell. It requires, above all, technical skill, much patience, and the capacity to command the trust and respect of those they serve.

Industry can no longer be an inexorable monster to wring the strength from men and women, then to cast them aside. It must and can find places for individuals of varying physical and mental capacity. It can and will make use of those who with the passing years find their physical powers waning. It admits of a high degree of adaptation of man and the work to which he is assigned, but these things it cannot do without the guidance and the aid of physicians. The medical profession can well afford, in the interests of its own technical accomplishments, to regard far more seriously and rationally than is the prevalent tendency, the part which work plays in the life of most men and women.

How many hospitals or physicians make accurate record of the specific occupations of their patients? How many physicians fully recognize the numerous industrial, social, and economic threads in the tangled skeins of distress and sorrow thrown hour after hour upon their desks? How many general surgeons really respect casualty surgery and think in terms of working hands and arms promptly returned to earning power? How many orthopaedic surgeons are willing to apply their fine talents to problems of functional restoration and abandon their passion for measuring periods of

treatment in astronomical terms, such as light years?

Industrial hygiene is surely a field for the best that medicine has to offer. Nothing less is good enough. Nothing less will even pay in dollars. For all that is said about the economic aspects of medical service, there is no honest physician who does not know in his heart that the money now paid for medical care would, were it paid for competent services, buy all that the public needs. All that the plumber, or the grocer, or the piano tuner asks of his doctor is the same standard of performance which the doctor expects when he goes into the market for plumbing or bread or piano tuning.

The industrial worker need not be the object of the solicitous concern of hospital trustees and ladies' aid societies. He can and will obtain for himself and his family sooner or later trustworthy medical and hospital care at a price he can afford to pay. Why not?

You in Canada have a glorious opportunity to work out your new plan of things with a minimum of error. You may well profit by the blunders which we, over the line, have made. The coming of industry to Canada need not mean the scarring of a fair land, the creation of communities which are an offense to man and surely to God. With forethought and with vigilant care industrial Canada can be made a place where men can work under safe and healthful conditions, where they can work with those who employ them, not under them, and reap the proper reward for their labour. Their children can grow in health and in the joy and opportunity which are the rights of childhood. Such a Canada is not a Utopia; we are living in it now.

Industrial hygiene is recommended to you, not as a panacea for all industrial ills, but rather as a vehicle for the very potent therapeutic principles of technical knowledge, human sympathy, and common sense.

THE PRESIDENTIAL ADDRESS BEFORE THE ONTARIO MEDICAL ASSOCIATION*

BY E. A. MCQUADE, M.D.,

Trenton, Ont.

[In beginning his address, Dr. McQuade expressed his thanks to the Association for electing him to the presidential office and his appreciation of the efforts of those associated with him to make the Annual Meeting a success. He continued].

IN calling to mind presidential addresses which one has heard and read during the past few years, one is reminded that the field which the President is at liberty to cover in his annual address is as wide as the seas; and, as has been said about our own great country, may be likened unto the telegraph wires which stretch from pole to pole. It is not my intention to-night to carry you back to Hippocrates, Socrates, Galen, and Company, and conduct you through the long journey of two thousand years up to the present time. I should like to touch upon a few points, some of which may be hackneyed, but all of which are of interest to us as representatives of the healing art in this province.

Looking for a few moments at medicine, as we read of it in history, we are struck with the fact that its progress was slow, because its exponents desired to prove all things. From time immemorial, cultists and faddists have come and spun their yarn and, finally, like the Arabs, have folded their tents to flit away; but medicine has continued to build, slowly, but nevertheless surely, fact upon fact, discovery upon discovery, until to-day we have not what we would claim to be an exact science but yet a science which is proving itself to be of great service to mankind. Knowledge, like the tide, is subject to ebb and flow, and, throughout the pages of history, we find epochs of advancement followed by periods of quiescence. During the past quarter of a century, scientific medicine has made remarkable strides. The teachings of Pasteur and Lister have become permanently and indissolubly assimilated in modern medical practice, and with their adoption we have seen marvellous advancements, both in scientific discoveries and thera-

* Delivered at the Forty-Ninth Annual Meeting of the Ontario Medical Association at Hamilton, May 29, 1929.

peutic accomplishments; and with what results! The orthopaedist of to-day takes the crippled child, the deformed baby, the halt and the maimed, and, in thousands of instances, gives back to the world a human being who is either normal or nearly so. The plastic surgeon, owing particularly to his wide war-time experiences, finds it possible to make of the disfigured face a presentable personality. The internist is now surrounded by aids which two decades ago were unknown. In the field of blood chemistry, functional tests, therapeutic aids—physical, diagnostic and electrical—the facilities which are now offered to the sick are marvellously in advance of those which were available for our forefathers. A few short years ago, the diabetic knew, without pronouncement from his physician, that his days were numbered. Thanks to Banting and his colleagues, hopelessness in this dread disease has given place to the joyous thought that a useful life may be lived and continued with the help of insulin. The anæmias, particularly pernicious anæmia, have taken their long toll of lives, many of them prematurely. Here again, hope is brought to the hearts of thousands by the use of liver extract. Unquestionably, this dread disease is being mastered in a way which a few short years ago seemed unlikely. The death rate in diseases of infancy has been more than cut in two. The terrible white plague, tuberculosis, which claimed the lives of thousands of our people every year, has shown a decrease in mortality of approximately 50 per cent in the last fifty years. But, while mention is being made of these wonderful forward strides, we must not lose sight of the fact that that dread disease, cancer, continues to claim more people every year. It would appear that the mortality rate has definitely increased in the past twenty years. But, let us take courage. One day—and, please God, it may come soon—the cause and cure of cancer will be found. It may come with startling suddenness, or it may be long delayed, but the peoples of the world have some satisfaction at least in realizing that no efforts are being overlooked in the medical and scientific world to master this devastating enemy of mankind.

So much for our achievements of the past, particularly in the last quarter century. Now, what of the future! He would be a brave man indeed, and certainly one not lacking in effulgent

imagination, who would undertake to forecast the future. However, with this apology, may I venture to predict, even if only for the pleasure of doing so, some things which I think we may reasonably hope for and expect? Infant mortality, particularly that resulting from the so-called children's diseases, will unquestionably decrease considerably in the not far distant future. People generally are just beginning to realize that diphtheria, scarlet fever, and other contagious diseases may be prevented. Why should children be allowed to run the risk of contracting these diseases, and thus take chances of more or less permanently injuring their bodies when we know that immunity may be established with comparative safety? It behooves our profession to educate the public to realize that prevention is better than cure.

Turning for a moment to the organic and constitutional diseases of adult life, I venture to say that the exponents of the medical and allied sciences will realize more and more their obligation to the public in teaching mankind what to eat, how to eat, how to work, the normal stress and strain which we, as individuals, should accept as our guide, in short—how to live. Then, mortality will be very greatly reduced and, conversely, longevity greatly increased. The span of life, within the last forty years, has increased by fifteen years, from 43 to 58. There is no reason why the biblical three-score years and ten should not be aimed at by all human beings. Again, I say, medicine of the future must stress and will stress the preventive side,—how to keep well—how to live. This is the task which we, as physicians, should recognize as ours, and thus give to mankind which looks to us for guidance in health matters, the instruction to which it is entitled. So much for scientific and applied medicine.

Now, may I direct your attention for a few moments to the subject of sociological medicine, or, put in other words, our relation to the public? Dr. McClure, of "The Bonnie Briar Bush," is a familiar figure to us all. In thousands of homes hangs the picture called "The Doctor". It thrills us to read and think of the good old days when the family doctor was not only physician but counsellor, adviser, and friend. Maybe he did not know a great deal about medicine, or as much, at least, as we think a good practitioner should know to-day. It was often true

THE DIFFERENTIAL DIAGNOSIS OF CLINICAL CONDITIONS ACCOMPANIED BY JAUNDICE*

BY DUNCAN GRAHAM, M.B.,

Toronto

JAUNDICE is the term applied to clinical conditions in which the tissues, sclera, mucous membranes and skin are stained yellow by bile pigment. That this deposit of bile pigment in the tissues occurs in a variety of conditions associated with diseases of the liver and biliary passages, and in certain forms of anæmia, has been known and recognized by clinicians for a long time. On the other hand, the accurate diagnosis of the disease condition responsible for the development of jaundice in different cases has been only too often difficult or impossible. This has been due chiefly to our lack of precise knowledge of the physiology of bile pigment formation. However, the discovery of a suitable method for the estimation of bile pigment in the blood, recent investigations of the site of bile pigment formation, and the relationship of the liver to bile pigment metabolism, both in health and disease, have given us a new theory of the mechanism of jaundice, and a new classification of its clinical varieties, which are proving of the greatest value in the diagnosis of conditions accompanied by jaundice.

Bile pigment is derived from hæmoglobin. The older view that this transformation occurs in the hepatic cells must be discarded. In the light of recent investigations it may be stated that the bile pigment, bilirubin, is formed in the endothelial cells belonging to the reticulo-endothelial system. These cells, which are found chiefly in the spleen and bone marrow, and to a lesser extent in the liver (as the Kupffer cells), take up hæmoglobin particles coming from the disintegration of red blood corpuscles, which is going on in the body continually, remove the iron-free portion of the hæmoglobin, and form bilirubin. This in turn is carried by the blood stream to the liver, is taken up by the polygonal cells of this organ, is excreted into the bile capillaries, and through the bile ducts reaches the intestine. Here it is converted into urobilinogen by the bacteria of the intestinal tract; some is excreted in the fæces,

and the remainder reabsorbed and carried to the liver by the portal vein, to be again taken up by the polygonal cells and excreted.

By the use of the method discovered by van den Bergh for the estimation of bilirubin in the blood it has been found that under normal conditions the blood contains a certain quantity of bilirubin—0.2 to 0.4 units—and that if from any disturbance in the body this increases to 4 units the tissues of the body are stained yellow. Jaundice, therefore, develops as the result of an excess of bilirubin in the blood, or a bilirubinæmia. As suggested by McNee, bilirubinæmia may result from an obstruction of the bile ducts to the outflow of bile, as from a stone in the common duct;

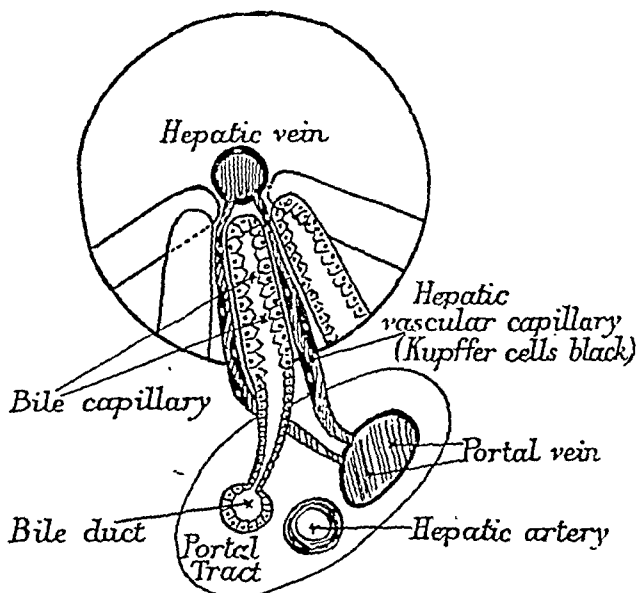


DIAGRAM OF LIVER LOBULE. (AFTER MCNEE).

from damage to the polygonal cells of the liver interfering with the secretion of bile, as in toxic hepatitis from arsphenamine poisoning; or from increased destruction of red blood corpuscles, resulting in an excess formation of bilirubin, as in familial hæmolytic jaundice.

In order to clearly understand how an obstruction to the outflow of bile, damage to the polygonal cells of the liver, or an excessive production of bilirubin may cause jaundice it is necessary to recall certain facts with reference to

*Read at the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, June 19th, 1929.

the structure of the liver and consider the pathological changes occurring under the conditions just mentioned. For this purpose McNee's conception of the structure of the liver lobule and the relationship to it of the portal vein, hepatic artery, and bile duct is very helpful. He represents the polygonal cells of the liver as a series of test tubes with the blind end towards the central vein and the lumen opening into the bile duct. On the outside of the tube, and between adjacent tubes, is a capillary network formed from the branches of the portal vein and the hepatic artery. This arrangement brings the blood in close contact with the polygonal cells of the liver. Under normal conditions the small quantity of bilirubin formed from the normal disintegration of red blood corpuscles is carried by the hepatic artery to the liver lobule, passes through the polygonal cells of the liver into the bile capillaries, and is excreted into the intestine. As has already been mentioned, part is reabsorbed as urobilinogen and the remainder excreted in the fæces.

If the common bile duct is obstructed the bile is dammed up in the bile capillaries and, as it cannot escape, is reabsorbed by the vascular capillaries and enters the central vein, thereby causing an excess of bilirubin in the general circulation, and a deposit of bile pigment in the tissues of the body results. In jaundice due to obstruction of the outflow of bile the polygonal cells are normal and able to secrete bile, and the bilirubin formed by the reticulo-endothelial system is normal in quantity. If the polygonal cells of the liver become damaged from poisons carried to it by the portal vein or hepatic artery the secretion of bilirubin is interfered with. As a result, the quantity not secreted passes directly into the central vein, causing a bilirubinæmia in proportion to the severity of the cell damage. Although the same poison may damage the red blood corpuscles and cause an increased formation of bile pigment, and even obstruction to the outflow of bile from pressure on the bile capillaries in the liver by the damaged polygonal cells, the primary and essential cause in this form of jaundice is damage to the polygonal cells themselves. In conditions causing an increased destruction of red blood corpuscles there is an excessive formation of bile pigment. The quantity of bilirubin formed and carried to the liver is too great for the polygonal cells to secrete rapidly enough. The excess, therefore, passes directly into the central vein, resulting in a bilirubinæmia. In this form, known as hæmolytic jaundice, the polygonal cells

are normal and there is no obstruction to the outflow of bile. All varieties of jaundice therefore result: (1) from interference with the outflow of bile; (2) from damage to the polygonal cells of the liver; (3) from increased destruction of the red blood corpuscles. Upon this theory of the development of jaundice McNee has suggested the following classification:—

- (1) obstructive hepatic jaundice;
- (2) toxic or infective hepatic jaundice;
- (3) hæmolytic jaundice.

Experience has shown that all clinical cases of jaundice can be classified under one or more of these three varieties.

Our first object in the diagnosis of a case of jaundice should be to determine from the results of our clinical examination the primary cause of the jaundice: interference with the outflow of bile, damage to the polygonal cells of the liver, or increased destruction of the blood; and our second object, the consideration of the possible clinical causes of the variety or varieties of jaundice present. The clinical examination must include an accurate record of the patient's complaint, a complete physical examination, and an examination of the urine and fæces for bile and urobilin, and of the blood for signs of anæmia. In the history of the present illness it is important to secure as accurate an account as possible of the patient's symptoms at the onset of the jaundice and up to the time of observation, noting not only the sequence in their appearance, their duration and intensity, but the time relationship between their development and the first sign of jaundice. Careful inquiry should be made as to the colour of the urine and stools. A change in the colour of the urine may be noticed before the appearance of jaundice in the sclera and skin. The colour of the stools may provide the clue to the diagnosis. They may be clay-coloured from the onset of the jaundice, as in obstruction due to gall stones in the common duct; normal or darker in colour in hæmolytic jaundice; or normal in colour at the onset, later becoming temporarily lighter or clay-coloured, in toxic hepatic jaundice. This is the usual history in catarrhal jaundice which is a toxic hepatic form of jaundice.

The presence or absence of pain is of very great importance in diagnosis. Jaundice following attacks of colicky pain is nearly always due to an intrinsic obstruction in the common bile duct, usually a gall stone, less often a simple stricture, or carcinoma of the wall of the duct. In obstructive hepatic jaundice due to extrinsic causes, as

from pressure from enlarged glands in secondary malignant disease, and in toxic hepatic or hæmolytic jaundice, colicky pain is usually absent, the patient complaining only of aching or soreness in the right upper quadrant of the abdomen. Other symptoms present at the onset may suggest primary disease of the liver, or disease of other organs with secondary changes in the liver or bile ducts, or disease of the blood-forming organs. A history of lassitude, loss of appetite and general weakness, with or without fever, followed later by nausea and vomiting is common with disturbances of liver function. While these symptoms occur in other conditions, their presence before, and persistence after, the appearance of jaundice is very suggestive of intrahepatic rather than extrahepatic disease as the cause of the jaundice, *i.e.*, a toxic or infective hepatic type of jaundice. In the past history one should especially enquire into the question of previous attacks of jaundice, recurring infections, upper gastrointestinal tract disturbances, and any illness suggesting disease of the liver or blood-forming organs, and should try to determine if the onset of the present attack of jaundice is or is not related to a former illness.

In the physical examination of the patient, special attention should be given to the examination of the liver and spleen for local signs of disease, and to other regions of the body for primary disturbances, as myocardial disease with failure, pregnancy, etc., that might affect the liver secondarily and cause jaundice. In the examination of the liver its size, and the presence or absence of tenderness, are the two points of greatest value in diagnosis. The consistency and the presence or absence of irregularities are of lesser importance. Irregularities on the surface of the liver indicate intrahepatic disease as the cause of the jaundice, but unfortunately only the gross, and not the finer irregularities more commonly present, can be determined with any degree of certainty on physical examination. A definite enlargement or the presence of local or general tenderness of the liver points to intrahepatic disease as the cause of the jaundice. If one excludes cases of enlargement or tenderness due to venous engorgement from chronic myocardial disease with failure, to distension from bile in obstruction of the common duct, and to metastases from new growths, the finding of an easily palpable liver, more especially if associated with tenderness, indicates a toxic or infective hepatic type of jaundice. Metastatic new growths in the liver may cause a marked enlarge-

ment, but if jaundice is present it is more likely to be due to pressure on the common duct from metastases in glands than from secondary new growths within the liver. In certain cases of jaundice the liver may be smaller than normal. This is found in portal or atrophic cirrhosis, and in acute or subacute necrosis of the liver, commonly called acute yellow atrophy, a condition in which a toxic or infective hepatic type of jaundice is present. In the early stage the liver may be palpable; later it becomes smaller than normal, due to necrosis or atrophy. In acute cases of necrosis the size of the liver is of more importance in prognosis than diagnosis.

As the spleen is often enlarged in diseases of the liver and in hæmolytic types of jaundice, it is important to examine for a palpable spleen. The presence of a definite splenomegaly with little or no enlargement of the liver suggests that the primary cause of the jaundice is splenic or extrahepatic in origin. In the hæmolytic type of jaundice the spleen is usually palpable, seldom large; the liver is normal in size and not tender. In biliary cirrhosis both spleen and liver are markedly enlarged, tenderness is slight or absent, and the jaundice is permanent, becoming more severe as the condition progresses. In portal cirrhosis the spleen is just palpable, the liver moderately enlarged, normal or smaller than normal in size.

If the clinical history suggests disturbances of regions of the body other than the liver and spleen, which may secondarily affect the liver and cause jaundice, special attention must be given to the physical examination of the system or systems affected. In most cases valuable information can be obtained from the examination of the stools, urine and blood. A sample of the stool should be examined macroscopically and tested for bile pigment and the urine tested for bile pigment and urobilin. With complete obstruction of the common duct the urine contains bile, rarely urobilin; in toxic or infective hepatic jaundice, bile and urobilin; and in hæmolytic jaundice, urobilin and no bile. If a hæmolytic type of jaundice is suspected the fragility of the red blood corpuscles should be determined. The presence of a heightened fragility is diagnostic of familial or acquired hæmolytic jaundice. In recent years the van den Bergh test for the detection of bilirubin in the blood has been employed in the differentiation of the various types of jaundice. This test gives a prompt "direct reaction" in obstructive hepatic jaundice, and an

"indirect reaction" in hæmolytic jaundice, and is of use in the diagnosis between these two types. At the onset of toxic or infective hepatic jaundice a "biphasic reaction" is present, but later a "direct reaction" occurs in nearly all cases, which makes the test of little positive value in the diagnosis between an obstructive and toxic hepatic jaundice. The presence of a prompt direct reaction, therefore, is no indication for operative interference, unless the other clinical findings indicate that the jaundice is due to obstruction of the extrahepatic bile ducts.

With the data obtained from the clinical history and the physical and laboratory examinations, one proceeds to determine the variety of jaundice present. The diagnosis between a hæmolytic and an obstructive or toxic hepatic type of jaundice is not difficult. In the hæmolytic form the jaundice is rarely severe; the onset is usually insidious and the patient is not acutely ill, except in certain rare cases of acute hæmolytic anæmia. The liver is not enlarged and the spleen may or may not be palpable. The stools are normal or darker than normal in colour, and the urine shows urobilin and no bile. In the differential diagnosis between a primary obstructive hepatic type of jaundice and toxic or infective hepatic jaundice with signs of obstruction, correct diagnosis is often difficult. One must attempt to differentiate an obstructive intrahepatic lesion from one due to extrahepatic causes, for in the former operation

is rarely indicated, while in the latter operative treatment is often necessary. The following points seem the most helpful in the differential diagnosis of these two types of jaundice: the presence of colicky pain indicates an obstruction of the common bile duct as the cause of the jaundice; if it is complete the stools are clay-coloured from the beginning of the jaundice, and the urine contains bile and usually no urobilin. An easily palpable liver, especially if associated with tenderness, suggests intrahepatic disease and a toxic or infective hepatic type of jaundice. The stools are usually normal in colour at the onset and later become paler or clay-coloured if signs of obstruction develop. The urine contains bile and urobilin.

Having decided upon the type of jaundice present, one must consider next the second object in diagnosis, the possible clinical cause. Bearing in mind the different causes of jaundice, their clinical manifestations, and the type of jaundice, according to the above classification, present in each, one can usually arrive at a correct diagnosis.

In this paper no effort has been made to consider in detail the different clinical causes of jaundice as these are familiar to all, but rather to review our present knowledge of bile pigment metabolism and to indicate the way in which it can aid us in the clinical investigation of patients suffering from the symptom—jaundice.

"PARAFFINOMA" OF THE RECTUM.—In the Section of Surgery, British Medical Association, July 26, 1929, Dr. A. T. Bazin (Montreal) described a case of "paraffinoma" of the rectum resulting from the injection of melted hard paraffin for the treatment of prolapsing internal hæmorrhoids. The patient was referred to him with the diagnosis of carcinoma of the rectum. At the distance of $1\frac{1}{2}$ inches from the anus was a nodular mass completely encircling the bowel and producing marked stenosis; the vertical extent of the infiltration was $2\frac{1}{4}$ inches. The mucosa was smooth, mobile, and non-ulcerated. Extending distally from the constricting ring were tongue-like processes under the mucous membrane. The tumour was resected, preserving the lower end of the canal and sphincters and restoring continuity by rectorrhaphy. Another case—of paraffinoma of the thigh—was reported in a woman who had received three injections of camphor in oil as a cardiac stimulant eight years previously.

Lantern slides were shown illustrating the histology of the tumour in these two cases. Dr. Bazin said that clinical observation and experimental work with monkeys had demonstrated that mineral oils, when injected, might cause foreign body reaction and tumour formation. In some cases the injected paraffin oil had spread along the lymph channels and lymph nodes, producing a condition simulating tuberculous adenitis or malignant lymphatic metastases. Vegetable oils injected experimentally had not produced these tissue masses. Mr. J. P. Kilner condemned the use of injection of paraffin into the human tissues. He had seen a large number of pathetic cases where paraffin had been injected to restore the contour of the face and neck. The histological appearance of the paraffinomata removed were similar to those demonstrated. One case of a large epithelioma which extended from the clavicles to the nipples was described; it had developed after the injection of paraffin.

THE LATE TOXÆMIAS OF PREGNANCY*

By ROSS MITCHELL, M.D., C.M.,

*Associate Professor of Obstetrics, Faculty of Medicine, University of Manitoba,
Winnipeg*

NO one in this audience needs to be reminded that the toxæmias of pregnancy constitute a serious menace to the health and future well-being of the pregnant woman and her child. Dr. Helen MacMurchy's report showed that of 1,532 maternal deaths in Canada from July 1, 1925, to July 1, 1926, 344, or 22 per cent, were due to the toxæmias of pregnancy. In England and Wales during the year 1926, out of a total of 2,860 maternal deaths, 524, constituting 18.3 per cent, were due to puerperal albuminuria, nephritis, and uræmia. In the United States Registration Area during the year 1921 there were 15,027 puerperal deaths, of which 4,032, or 26.8 per cent, were due to puerperal albuminuria and convulsions. According to Eden and Holland, the toxæmias affect 3.5 per cent of all pregnant women. In 2,656 confinements occurring in the public wards of the Winnipeg General Hospital from July 1, 1923, to December 31, 1928, there were 119 cases of toxæmia, an incidence of 4.48 per cent. In 4,202 confinements in both public and private wards of this hospital, during the years 1924 to 1928 inclusive, there were 177 toxæmic cases, an incidence of 4.21 per cent. In the public ward series, out of 119 cases of toxæmia there were two deaths; and in the other series (public and private admissions), in 177 cases of toxæmia there were 7 deaths.

In addition to the maternal mortality caused by the toxæmias there is a vast amount of morbidity and a tremendous wastage of foetal life. Of all the maternal diseases, toxæmia is the one which is most lethal to the child. Thus, Holland, investigating 301 foetal deaths, showed that seventy-seven, *i.e.*, 26 per cent, were caused by albuminuria, eclampsia or accidental hæmorrhage. Moreover, many children born alive from toxæmic mothers survive only a short time.

It is my purpose in this paper to consider what steps may be taken to cut down the number of deaths and casualties arising from this source, and to attempt to lay down the duties that an obstetrician owes to his toxæmic patient. Owing to lack of time I propose to leave hyperemesis gravidarum out of the picture; it belongs to the first third of pregnancy, whereas the other toxæmias occur for the most part in the latter third, and the pathological changes in the liver following pernicious vomiting are quite distinct from the changes found after eclampsia.

One must admit that there is no unanimity in the classification of the late toxæmias. The differences when analysed, however, are more apparent than real, and depend chiefly on the view-point of the observer, and whether the basis of classification is pathological or clinical. Cruikshank, Hewitt and Couper of Glasgow¹ offer the following classification:

1. Albuminuria (no other signs of toxæmia, or only slight and transitory signs).
2. Pre-eclamptic toxæmia (albuminuria, plus more or less severe toxæmia, but without convulsions).
3. Nephritic toxæmia (albuminuria, plus signs of chronic renal disease and in some cases cardiac involvement).
4. Eclampsia (severe toxæmia with convulsions).

H. J. Stander² lays down this classification:

1. Eclampsia.
2. Pre-eclampsia.
3. Chronic nephritis complicating pregnancy.
4. Eclampsia superimposed upon nephritis.
5. Low reserve kidney.

Pre-eclampsia he considers as a stage immediately preceding eclampsia, and forming only a small group, not more than 5 per cent of toxæmias, and, since his fourth class, "eclampsia superimposed upon nephritis," is simply a combination of eclampsia and chronic nephritis, (a very rare type of toxæmia), he narrows his classification to three main groups:

1. Eclampsia.
2. Nephritis complicating pregnancy.
3. Low reserve kidney.

* Read before the Section of Gynæcology and Obstetrics at the sixtieth annual meeting of the Canadian Medical Association, Montreal, June 21, 1929.

As the latter term is a new one it may be well to quote Whitridge Williams³ definition: "In the latter condition, (low reserve kidney), which may be due to congenital causes or to such factors as may have lessened the number of functioning glomeruli without producing a chronic nephritis, the kidney reserve has become so reduced that, while it suffices for the usual conditions of life, it breaks under the strain of the last months of pregnancy. That it does not lead to chronic nephritis is shown by the fact that the condition may or may not recur in subsequent pregnancies; and if it does recur, the symptoms are usually no more severe than on the previous occasion. In patients presenting this condition, the blood pressure is not greatly elevated, rarely exceeding 150 systolic and 90 diastolic; the albumin content varies between a trace and a couple of grams per litre, and, while the patient may present œdema, headache and more or less malaise, the condition improves with rest in bed and a restricted diet, and rarely if ever eventuates in eclampsia. Following delivery, there is a prompt return to normal and any trace of the condition is not detectable until a subsequent pregnancy occurs, when it may or may not become manifest in the latter months. Change does not occur in the chemical constitution of the blood, and the phenolsulphonphthalein output is not altered." The "low reserve kidney" class of Stander and the "albuminuria" class of Cruikshank, Hewitt and Couper evidently correspond.

G. F. Gibbert,⁴ of Guy's Hospital, London, approaching the question of classification from the viewpoint of the late results to the patient, sets forth the following clinical types:

1. Patients with chronic nephritis preceding the pregnancy. These patients, of course, continue with signs of renal deficiency after pregnancy. They form the "nephritic" group.

2. Patients, presumably healthy before pregnancy, who develop albuminuria during pregnancy, but in whom all signs and symptoms of renal disease disappear after delivery, and do not recur with a subsequent pregnancy.

3. Patients, presumably healthy before pregnancy, who develop albuminuria during pregnancy, and in whom all signs and symptoms of renal disease disappear after delivery but recur regularly with subsequent pregnancies.

4. Patients, presumably healthy before pregnancy, who develop albuminuria during pregnancy, but in whom all the signs and symptoms of renal disease persist.

The patients of type 4, he says, are really members of the second group who, as a result of their first pregnancy toxæmia, develop

chronic nephritis and thereafter become members of the first group. It is the cases of the third group, he states, that cause so much difficulty in classification since, although they are apparently healthy in the intervals between their pregnancies, yet they fairly consistently show recurrence of the albuminuria with each succeeding pregnancy. If these cases were rare, he says, we might explain their occurrence as the result of chance, but when we realize that they form about half of all the cases of albuminuria, it is quite obvious that something more than chance is operating in favour of recurrence. It will be observed that Gibbert's second and third classes correspond with the "low reserve kidney" class of Stander and the "albuminuria" class of the Glasgow school. All three classifications have a nephritic toxæmia group.

Gibbert is not alone in touching on the importance of recurrent toxæmia. James Young,⁵ tracing the subsequent histories of cases of eclampsia and albuminuria treated in the Edinburgh Royal Maternity Hospital from 1919 to 1926, has shown that eighty-two out of a total of 144 subsequent pregnancies were vitiated by toxæmia, or intra-uterine disaster to the fœtus without toxæmia, that is a percentage of 57. He has further shown that of the albuminuric group 8 per cent subsequently showed signs of renal disease. F. S. Kellogg,⁶ of Boston, has also called attention to recurrent toxæmia as a clinical entity and to the need for further study of this problem.

Evidence is accumulating that premature separation of the normally implanted placenta, or accidental hæmorrhage, is, in many cases at least, due to toxæmia. P. Willson,⁷ considers that utero-placental apoplexy is caused by the inundation of the uterine wall with a toxin of the nature of a hæmorrhagin, liberated from the placenta, and, naturally, producing its maximum effect at the site of its absorption and greatest concentration, and that accidental hæmorrhage is probably in the great majority of cases a manifestation of the same process. Kellogg, Taylor, Eades and Weller⁸ believe that every effort should be made to link up these cases with the toxæmia-chronic nephritis group and study them with careful tests.

Of the measures designed to lessen the damage caused by the toxæmias, prophylaxis

far outweighs any method of treatment to be applied after convulsions or coma have supervened. Prophylaxis is summed up in "prenatal care." In our present state of civilization, and with our present lack of knowledge regarding the toxæmias, we cannot hope greatly to reduce the incidence of toxæmia, though with education of the public as to the need for proper diet, sufficient sleep and moderate exercise, and the avoidance of constipation during pregnancy, much might be done. With pre-natal care we can, however, hope to prevent the toxæmias from assuming malignant forms, and with post-natal care we can properly classify the toxæmic patients and give the advice appropriate to each class. Without such knowledge of our patients we may in our advice err on the side of too great severity or too great leniency. One may cause as much mental suffering by forbidding subsequent pregnancy to a woman in the "low reserve kidney" class as by sanctioning pregnancy in chronic nephritis.

I believe that the significance of the condition, recurrent toxæmia, has not sifted through to the bulk of our profession. There is still an unfounded optimism that if albuminuria occurs during pregnancy, either without other symptoms, or with only moderate rise of blood pressure, œdema, headache and malaise, all will be well after delivery. Yet we have seen from Young's figures that a woman who has had albuminuria has less than an even chance in subsequent pregnancies either of escaping toxæmia or having a live baby. Any pregnant woman with albuminuria and a systolic blood pressure of 140 or more is as critically ill, so far as end-results are concerned, as if she had acute appendicitis or typhoid, and equally with the victims of these maladies, demands our best care. Such a patient should be placed in a hospital if one is available. To trust that directions to the patient to rest in bed, feed on a watery diet, and take salines each morning, will be carried out in the home is to lean on a broken reed. Only in a hospital can these directions be carried out to the letter, and, in addition, the resources of the hospital laboratory are required for repeated examinations of the urine, blood chemistry, and renal function tests. In doubtful cases the eye ground should be examined. If, after treatment, and with

favourable reports on the urine and blood, the patient can be definitely assigned to the "low reserve kidney" or "albuminuria" group, she may be discharged from the hospital with at least a reasonable hope that pregnancy will continue through to term or viability. If, on the other hand, the symptoms progress in severity in spite of skilful treatment, or if investigations reveal the existence of chronic renal damage, the pregnancy must be terminated lest worse evils befall.

Time does not permit discussion of the operative treatment of the toxæmias, but one point of marked importance in this connection may be mentioned. Stander has shown that ether, chloroform, nitrous oxide, and ethylene produce changes in the blood constituents very similar to those seen in eclampsia, as well as pronounced liver lesions and changes in the kidneys. In experiments with novocaine or procaine, injected subcutaneously, he was unable to detect any changes in the blood constituents due to the anæsthesia. In view of these findings it would appear to be wise, whenever operative procedures on toxæmic patients are indicated, to substitute local or spinal anæsthesia for general anæsthesia.

The admission of the possibility of recurrent toxæmia means that to do justice to our toxæmic patients we must greatly extend the duration and scope of post-natal care. Post-natal care should include the following points.

First, each patient should be carefully studied, especially as to the condition of the cardiovascular system, blood-urea, and renal function, with possibly ophthalmoscopic examination, to ascertain whether there is any demonstrable sign of chronic renal change.

Second, the period of supervision should extend over months rather than weeks.

Third, the after-history of these patients and particularly the outcome of future pregnancies should be recorded.

Fourth, these patients should be told, as precisely and clearly as possible, the prognosis, especially the effect of possible future pregnancies.

Fifth, in the event of a subsequent pregnancy they should be advised to put themselves under supervision as soon as possible.

Sixth, gross sources of focal sepsis, *e.g.*, diseased tonsils and teeth, should be removed, since

these lower general resistance and may be a factor in the production of toxæmia.

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GASTRIC AND DUODENAL ULCER*

A REVIEW OF ONE THOUSAND SEVEN HUNDRED X-RAY EXAMINATIONS

BY BERNARD MOONEY, M.D.,

Radiologist, Edmonton General and Misericordia Hospitals,

Edmonton, Alta.

THE following observations are based principally on a review of 1700 gastro-intestinal x-ray examinations done at my office and the General and Misericordia Hospitals. Nine hundred and ninety-five patients were examined at the hospitals and 706 at my office, the technique used in each place being approximately the same. All of the patients were referred by their physicians on account of signs and symptoms pointing to a lesion somewhere in the gastro-intestinal tract or gall-bladder. The following tables are a summary, with special reference to the occurrence of gastric and duodenal ulcer as reported from x-ray findings in these cases:

TABLE I

Gastro-intestinal examinations	1701	
Gall-bladder examined with gastro-intestinal tract in	460	
Gall-bladder only examined in	174	634
Colon examined with gastro-intestinal tract in	115	
Colon alone examined in	81	196

TABLE II

(X-ray findings in above)

Gastric ulcer	51	
or 3 per cent of cases examined		
Duodenal ulcer	183	
or 10.7 per cent of cases examined		
Gastric and duodenal ulcer in the same patient ..	5	
Mal-functioning gall-bladder, with or without stones	243	

It will be noted that in the total number of patients suffering with gastric ulcer (51) a duodenal ulcer also was found in 5, or approximately 10 per cent.

* Read before the annual meeting of the Alberta Medical Association, September 18, 1928.

The question of gastric or duodenal ulcer is involved in practically every radiological examination of the digestive system, and a report without a positive or negative finding in regard to these two conditions is, in most cases, of little assistance to the referring physician.

In the differential diagnosis of abdominal disease the x-ray report has gradually come to be of prime importance, and its findings can also aid quite often in indicating whether the treatment shall be medical or surgical. The radiologist very often could, and probably should, state whether the ulcer is small and recent, whether it is obstructive, or whether perforation has already taken place and is walled off by inflammatory reaction. This information should have a bearing on the type of treatment.

I have made a practice of obtaining a brief history after the radiological diagnosis is made, and in the majority of instances the history and x-ray findings agree. If they do not, both radiologist and clinician should re-examine the patient. There are, of course, a certain number of patients with both gastric and duodenal ulcer, or with other combinations of pathological conditions, such as diseased gall-bladder and appendix, cholecystitis and duodenal ulcer, etc. In this type of patient, and they are not by any means uncommon, the clinical history may be confusing, and I believe a painstaking x-ray examination has some points of advantage.

The radiological signs of gastric and duodenal ulcer are usually described separately, but there

does not appear to be any substantial reason for this, especially since we do not know definitely the cause of either gastric or duodenal ulcer. While the description of radiological signs in these two diseases may be considered together on account of their morphological similarity on the films and on the fluoroscopic screen, it would not be accurate to make an x-ray diagnosis of "peptic ulcer". The actual lesion is either in the stomach or in the duodenum and is, therefore, either a gastric ulcer or a duodenal ulcer. If the internist considers that the treatment of gastric and duodenal ulcer should be the same, he might be excused for using the term "peptic ulcer", but for the radiologist or the surgeon to use it would be ambiguous and would indicate loose reasoning.

Another term sometimes noticed is "pyloric

ulcer" or "juxtapyloric ulcer". From a radiological standpoint this would be a rare occurrence. As a matter of fact, gastric ulcer is practically always an inch, at least, from the pyloric sphincter, and while a duodenal ulcer may in time spread to the pyloric opening, causing obstruction, and even into the stomach, nevertheless it is duodenal in origin.

The most important x-ray signs of gastric and duodenal ulcers may be classified as follows:

1. *Direct or pathognomonic signs:*—

- (a) The niche
- (b) The accessory pocket
- (c) The organic hour glass contraction

2. *Indirect or spastic signs:*—

- (a) The incisura
- (b) The spasmodic hour-glass contraction.
- (c) The six-hour retention in the stomach
- (d) The hyperperistalsis of the stomach
- (e) The hypermotility shown by progress of the meal.

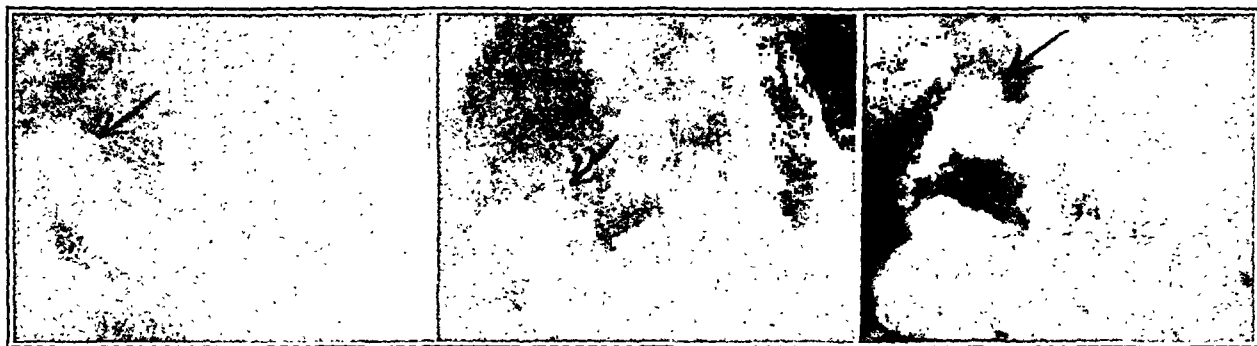


FIG. 1.—*Duodenal ulcer.*—Large amount of scar tissue causing deformity. Niche indicated by arrow. Patient presented classical signs and symptoms of duodenal ulcer, including 30 per cent 6 hour retention and had had two rather severe hæmorrhages.

FIG. 2.—Plates of the same patient as shown in Fig. 1, taken after the physiological effect of belladonna was produced. Appearance of duodenal bulb almost identical, showing that the deformity was due to scar tissue instead of spasm.

FIG. 3.—*Duodenal ulcer.*—Repeated attacks in the spring and autumn for four years. No 6 hour residue. Characteristic niche indicated by arrow. No operation.



FIG. 4.—*Duodenal ulcer.*—Niche indicated by arrow. Clinical history and findings; those of early duodenal ulcer. Gall bladder negative with Graham-Cole dye test. No 6 hour residue. No operation.

FIG. 5.—*Gastric ulcer.*—Arrow points to niche type of deformity high up on the lesser curvature. Twenty per cent 6 hour residue. No vomiting; no hyperacidity. History and clinical findings, those of, gall bladder disease.

FIG. 6.—*Gastric ulcer.*—Common niche type. Arrow pointing to penetrating defect on the lesser curvature near the pylorus.

The niche, as depicted on an x-ray film or screen, is simply the opaque barium filling in the recess or crater resulting from the destructive ulceration in the stomach or duodenal wall. In the great majority of cases, if correct radiological procedures are followed, and a sufficient number of plates are made, the lesion can be made evident. Giving belladonna until the physiological effects are produced will very often bring out a niche or accessory pocket in the duodenal cap. Some consider spastic deformity of certain types sufficient, but with a little more persistence and thoroughness the radiologist can, and I believe should, express himself from a pathological and anatomical standpoint. The niche is considered pathognomic of ulcer and to the radiologist it means ulcer, just as surely as the section does to the pathologist or the appearance at operation does to the surgeon.⁴

If the ulceration proceeds to the point of perforation and an extra-luminal cavity is formed, this cavity filled with barium and shown on the films is called an accessory pocket. Duodenal ulcer is frequently of the perforating type. A small percentage of penetrating ulcers result in such large, infiltrated masses that the stomach presents the so-called organic hour-glass appearance.

The three important indirect manifestations of gastric and duodenal ulcer are the incisura, the spastic hour-glass contraction, and the spasm of the pyloric segment of muscle causing six-hour retention in the stomach. The last one is the most common and the most important. The incisura is an indentation or drawing in of the circular muscle fibres in the same segment as the ulcer, and is usually caused by the irritation in the ulcerated area. The spastic hour-glass contraction is one in which a large segment of muscle is involved in the spasm and the appearance is that of an hour-glass. These forms of spasm are not relaxed by antispasmodics, but are loosened by anæsthesia and are not seen at operation.

Retention in the stomach of one-eighth or more of the contrast meal for a period of six hours means trouble somewhere in the abdomen, and the most common causes are ulcer of the stomach or duodenum and carcinoma of the stomach. This form of gastrospasm is an every day occurrence. Hyperperistalsis is an increase in the number, rather than in the depth, of the peris-

taltic contractions. Two fairly deep peristaltic waves are not abnormal, but three or four vigorous waves are considered worthy of note.

The normal position of the most advanced portion of the barium meal at the six-hour interval is any place from the terminal ileum to the hepatic flexure of the colon. If the head of the meal is at the splenic flexure in six hours it is travelling faster than normal, and is said to be hypermotile. This hypermotility is an evidence of irritation at some point where part of the meal has passed. It may, for instance, be a diseased appendix, or a tuberculous cæcum, or a duodenal ulcer. Duodenal ulcer setting up a hyperperistaltic condition of the stomach is the most common cause.

Summing up the above, it can be stated that if a niche, accessory pocket, or an organic hour-glass contraction is in evidence either in the stomach or duodenum, there is an ulcer present. The organic hour-glass of gastric cancer is a possible exception, but the type of deformity is different and should rarely be mistaken.

The value of the indirect or spastic signs depends, to some extent, on the patience, skill, and judgment of the examiner. Carmen states,¹ "A residue in the stomach with an unbroken contour, that is to say without any evidence of gastric ulcer or cancer, should first of all suggest duodenal obstruction, the most common cause of which is duodenal ulcer. If in addition to the gastric retention there is a gastric hyperperistalsis the presence of a duodenal ulcer is practically certain." Again he states,² "When any form of gastrospasm exists after belladonna has been given to physiological effect, the existence of an intrinsic lesion is fairly proven, and most often that lesion is ulcer."

The indications for and the value of the gastro-intestinal x-ray examination are now generally recognized, and it would seem unnecessary to spend any time on this phase of the subject. Speaking of gastric ulcer, Sir Berkely Moynihan states,³ "Of all ancillary methods of diagnosis that of the radiologist should be of the greatest value. In the diagnosis of gastric ulcer it has pride of place; in competent hands it is far more accurate than any other methods of diagnosis, clinical or chemical, or all other methods combined. It is, indeed, so trustworthy that unless a diagnosis of gastric ulcer made on clinical evidence is confirmed by the radiologist it should

rarely, if ever, be accepted. There are, indeed, only two certain and unequivocal methods of making a diagnosis of gastric ulcer—that of the radiologist and that of the surgeon. Unless a gastric ulcer is seen we can never be quite confident of its presence. We must walk by sight and not by faith.” On the following page, in the same article, he states, “Deformities of the duodenal bulb are as certain an indication of ulcer as are the niche and notch in cases of gastric ulcer.”

In conclusion, I would state that if my experience with the series of examinations mentioned above has taught me anything it is that x-ray examination of the gastro-intestinal tract is a component part of the symptom and sign group that go to make the diagnosis of gastric

or duodenal ulcer. I do not agree with the physician or surgeon who states “I have made a diagnosis of gastric ulcer and I am referring the patient for x-ray confirmation.” I am convinced that the time has arrived when a diagnosis of ulcer should seldom be made without all the evidence, and that the x-ray report is an essential part of that evidence.

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THE ACUTE APPENDIX*

By O. W. NIEMEIER, M.B., F.R.C.S. (EDIN.),

Hamilton

I MAKE no apology for this contribution to the already voluminous literature on acute appendicitis, as operations for this disease constitute an important part of the work of every general surgeon and accounted for one-sixth of all the major operations in the Hamilton General Hospital in 1928. Moreover, the disease carries with it a considerable mortality. Quain and Waldschmidt¹ report a series of 1,000 cases with a mortality of 2.5 per cent. In 1928, in the Hamilton General Hospital, there were 239 operations for acute appendicitis with a mortality of 2.3 per cent.

This paper is based on a series of 136 consecutive cases operated upon by the author during the past few years without any mortality. Every case included showed definite, visible, macroscopic evidence of an acute pathological condition, and was confirmed by laboratory examination.

An analysis of these cases discloses some interesting facts. First, as regards the time of operation, we find that 55 per cent came to operation within 24 hours of onset; 16 per cent between 24 and 48 hours of onset; 28 per cent

after 48 hours, some of the latter being delayed 72 hours and longer, so that it is evident that they were not all early cases.

It is also of interest to note the frequency of occurrence of some of the commoner symptoms. Typical pain began in the epigastrium and later localized in the right iliac fossa in 87 per cent. Pain began primarily in the right iliac fossa in 13 per cent. Vomiting occurred in 47 per cent. Nausea occurred in 11 per cent.

The location of tenderness was as follows: at McBurney's point in 94 per cent; absent over McBurney's point in 5.5 per cent; in the loin in 1.8 per cent; abdominal tenderness entirely absent (per rectum only), 3.7 per cent.

The position of the appendix showed the following variations: medial or subcæcal, 53 per cent; retrocæcal, 24 per cent; pelvic, 21 per cent; high under liver, 2 per cent.

It is not the intention in this paper to attempt to deal exhaustively with the whole subject of acute appendicitis, but rather to stress the atypical case, and to call attention to certain practical points in diagnosis and treatment, as illustrated in this series of cases.

The typical case—presenting the classical picture of pain beginning in the epigastrium or

* Read before the Ontario Medical Association, May 31, 1929.

about the umbilicus and later localizing in the right iliac fossa, with vomiting shortly after the onset of pain, with tenderness over McBurney's point, and rigidity of the lower right quadrant—this characteristic syndrome requires little skill for its diagnosis. However, this picture is by no means always present. As noted above, pain began primarily in the right iliac fossa in 13 per cent of this series, 50 per cent did not vomit, and in 3.7 per cent there was complete absence of abdominal tenderness.

Atypical appendicitis is seen chiefly in two groups of cases: (1) those occurring as the result of, or in association with, some other disease, *e.g.*, pneumonia, pharyngitis or gastroenteritis; (2) those developing in an appendix which occupies an abnormal anatomical position, *e.g.*, retrocaecal or pelvic.

Regarding the first group, there were 7 cases which developed during respiratory infections as follows: 1 with influenzal pneumonia; 5 with influenza and bronchitis; 1 with pharyngitis.

The greatest difficulty in diagnosis was experienced in the case with pneumonia, as we realized the frequency with which pneumonia is associated with abdominal pain, and the ease with which acute abdominal lesions are simulated by this disease. However, in spite of the presence of a definite pneumonia, we were enabled to make the diagnosis of appendicitis on the strength of definite and persistent tenderness over McBurney's point, and a gangrenous appendix was removed.

Other cases which cause difficulty are those associated with diarrhoea, as here gastroenteritis may be diagnosed and the appendix overlooked, especially if abdominal tenderness is vague or indefinite. This point will be referred to again later.

The second large group of atypical cases, occurring in appendices occupying an abnormal anatomical position, may be divided into subgroups as follows: (1) appendix on the left side (none in this series); (2) high or sub-hepatic appendix, constituting 2.3 per cent of this series; (3) retrocaecal, 24 per cent; (4) pelvic, 21 per cent.

As there was no case of left-sided appendix, due to total failure of the intestine to rotate, I will not dwell on this type of case, but simply call attention to the fact that it may occur.

The high or sub-hepatic group, in which the caecum had failed to descend into the right iliac fossa, made up 2.3 per cent of my series. In all of these cases, some gall bladder lesion was suspected before operation. In one case the appendix literally had to be clipped away from the under surface of the liver.

The retrocaecal appendix, comprising 24 per cent of this series, did not present any serious difficulty in diagnosis, as with two exceptions there was definite tenderness over McBurney's point. In one of the exceptional cases the tenderness lay in the loin and did not appear over McBurney's point for 48 hours, at which time a gangrenous appendix was removed. The other patient, according to his doctor, never had any tenderness over McBurney's point, but it lay entirely over the postero-lateral region of the loin. When he was brought in I found a mass extending well above the crest of the ilium in the flank. The white blood cell count was 26,000 per c.mm.; temperature 101°; and the urine, negative. Probable retrocaecal appendix abscess was diagnosed, and a necrotic appendix removed from a very high retrocaecal position.

The acute appendix occupying a pelvic position is probably the most difficult and elusive from a diagnostic standpoint, and occurred in 21 per cent of my series. There were five cases which showed absolutely no tenderness whatever on abdominal palpation. The diagnosis in these was made by rectal examination, which disclosed tenderness and sometimes resistance on the right side. In one case, the physician who called me informed me over the telephone that his patient had all the symptoms of an acute appendix except the tenderness. On obtaining a typical history and finding no tenderness on abdominal palpation, I made a rectal examination and could feel a very tender structure, resembling a finger, lying alongside the rectum on the right side. A pelvic appendix was diagnosed, and at operation a gangrenous appendix the size of a wiener sausage was removed from a low pelvic position. In certain cases rectal examination is our sole guide in making a diagnosis, and in others, where the symptoms are vague and indefinite, is a means of converting a doubtful diagnosis into a certainty. I cannot over-emphasize the importance of making a rectal examination in every case of abdominal pain.

The differentiation of the pelvic appendix is further complicated by the frequent presence of symptoms referable to other pelvic organs, such as diarrhoea and frequent and painful micturition, due to irritation of the lower bowel and bladder respectively. In my group, diarrhoea occurred in only four cases and in the absence of marked abdominal tenderness it can be readily understood why gastroenteritis may be diagnosed and the appendix overlooked in these cases. Here again, rectal examination is the key to diagnosis.

Painful and frequent micturition was present in six of my cases and pus was found in the urine in one case. (A microscopic examination of the urine will usually exclude disease of the urinary tract). This finding of pus in the urine so complicated the diagnosis that the attending physician failed to suspect the appendix until some time had elapsed. On making a rectal examination, I discovered a mass and marked tenderness on the right side, and accordingly diagnosed a probable acute pelvic appendix with abscess, and advised operation. A pelvic abscess was found and drained, and a very necrotic and perforated appendix removed. Urinary symptoms, and even pus in the urine, do not always mean pyelitis in a case of right-sided abdominal pain. They may be caused by an inflamed appendix adherent to the bladder, or by a pelvic abscess, or the pus may simply be due to an old chronic cystitis. Rectal examination will establish the diagnosis in these cases.

Lastly, the differentiation between an acute pelvic appendix and salpingitis in the female may present serious difficulties, as the infection in the case of a pelvic appendix may travel across the pelvis and extend above the brim on the left side, giving rise to that bilateral tenderness so characteristic of salpingitis. One case of pelvic appendix was treated for two weeks on the mistaken diagnosis of salpingitis, but was finally drained, with removal of the appendix. In two other cases, not included in this series, operation was performed for an acute appendix and salpingitis found. The history of exposure, or the presence of an intact hymen, the presence of vaginal discharge, and the finding of gonococci in the cervical smear are valuable circumstantial evidence, but rectal and vaginal examination are the most certain means of differentiation. On rectal examination marked tenderness on the

right side usually means a pelvic appendix. On vaginal examination sharp pressure on or jolting of the cervix will elicit marked pain if salpingitis is present. One does not expect to feel masses in the acute early case of salpingitis, but usually some fixation of the uterus can be elicited, and I consider the findings on rectal and vaginal examination the most valuable aids in making the diagnosis.

Before concluding, a few words may be said regarding treatment. It is well recognized that the secret of success is early operation. I think that the doctrine of delayed operation in late cases, which we see advocated so frequently nowadays, has dangerous possibilities, especially if not thoroughly understood. The time element is no criterion on which to base our decision to operate, and to say that after forty-eight hours or any other arbitrary time period treatment should be non-operative is a fallacy. We frequently find more advanced disease in a case operated upon within six hours of onset than in one removed after forty-eight or even seventy-two hours; or, to put it differently, operation may often be as safely performed after forty-eight hours as during the first twelve hours.

The rapidity of the progress of the disease is controlled by the relative virulence of the infection and the resisting power of the patient, and not solely by the time which has elapsed, important as this undoubtedly is. The condition of the patient should be the sole guidance in making our decision to operate. Beyond doubt, certain late cases with marked toxæmia, general peritonitis and distension, are better treated conservatively, as operation would certainly be fatal, but in the vast majority, operation as soon as the diagnosis is made is the safest policy in my opinion. This was the practice in every case in my series of 136 cases with no mortality.

However, the type of operation and the technique employed are important factors in determining the mortality. I believe strongly, with Deaver, that a lateral approach, closely following the right lateral wall of the abdomen, should be employed, and for this I strongly favour the McBurney incision. Pus is aspirated by the suction apparatus as soon as it appears. Coils of small intestine are gently packed aside with a moist tape if they appear. Adhesions are left undisturbed and intact as far as possible, only those which bind down the appendix being separ-

ated. Care and gentleness are observed throughout.

It has been argued against the McBurney incision that a low-lying pelvic appendix cannot be reached through it. In many cases the appendix and cæcum can be drawn out through

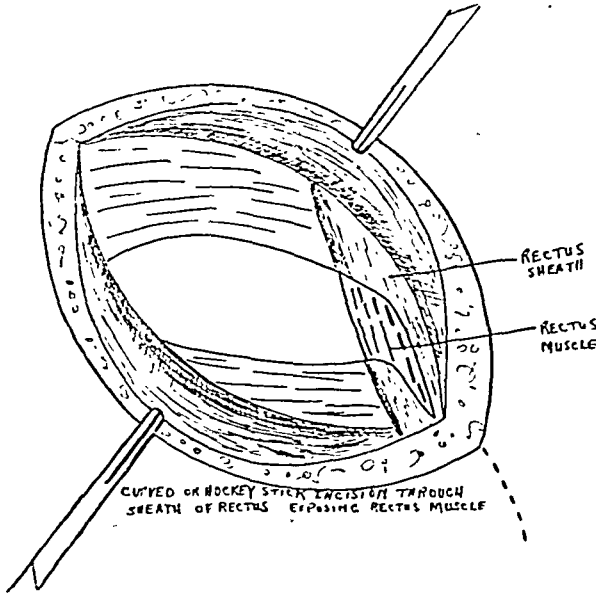


FIG. 1

the wound and the whole operation conducted outside the abdomen. If not, the gentle liberation of adhesions binding down the appendix may render this possible. In a small percentage of cases, however, it may be difficult or impossible to reach an appendix adherent low in the pelvis. Here the McBurney incision may be readily extended, as illustrated in the accompanying figures. There is nothing new in this method, but it seems to be unfamiliar to many.

It seems unjustifiable to use the Battle incision as a routine for this small percentage of cases, as dragging up a dirty appendix amid coils of uninvolved small intestine, or mopping

up pus through uncontaminated peritoneum, is a violation of surgical principles. The Battle, or rectus, incision should be used only when the diagnosis is in doubt, as the right lateral approach is a very important factor in keeping down the mortality rate in these cases.

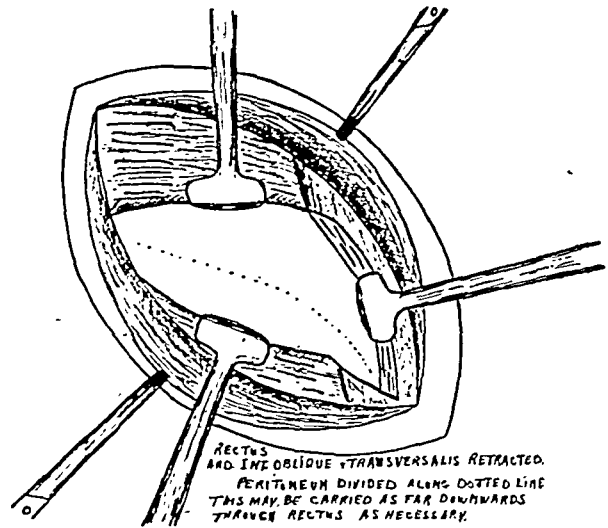


FIG. 2

SUMMARY

In conclusion, I would summarize as follows:

1. The typical clinical picture is by no means always present, and we must be prepared to recognize deviations from normal.
2. Rectal examination is of primary importance in the diagnosis of many cases of pelvic appendicitis, and should never be omitted in any case of abdominal pain.
3. I would stress the value of the McBurney incision and call attention to a valuable method of making it available for all cases of appendicitis.

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"And of those things which are incumbent on the student of this Art are that he should constantly attend the hospitals and sick-houses; pay unremitting attention to the conditions and circumstances of their inmates in company with the most acute professors of Medicine; and enquire frequently as to the state of the patients and the symptoms apparent in them, bearing in mind what he has read about these variations, and what they indicate of good or evil. If he does this, he will reach a high degree in this Art. Therefore it behoves him who desires to be an accomplished physician to follow closely these injunctions,

to form his character in accordance with what we have mentioned therein, and not to neglect them. If he does this, his treatment of the sick will be successful; people will have confidence in him and be favourably disposed towards him, and he will win their affection and respect and a good reputation; nor will he lack profit and advantage from them. And God Most High knoweth best."—Haly Abbas.

"It is impossible to find a good physician who is not at the same time a good physiognomist."—J. C. Lavater.

A CASE OF PEDUNCULATED CARDIAC THROMBOSIS ACCOMPANIED BY AN AORTIC,, RENAL, AND MESENTERIC THROMBOSIS*

BY CHARLES W. FULLERTON, M.D.,

*Former Resident Physician, Montreal General Hospital,
Baltimore, Md.*

ALTHOUGH much has been written concerning pedunculated cardiac thrombi, comparatively few cases have been reported, Scholtz in 1914 finding only 12 cases in the literature. As the condition is so rare and as, in addition, the following case presented such interesting embolic and thrombotic phenomena, it is deemed worthy of presentation.

Mrs. C. B., aged 33 years (No. 2963-28) was admitted on May 28, 1928, to the service of Dr. C. P. Howard at the Montreal General Hospital.

Complaints.—Heart trouble; pain in the right foot and leg; coldness and blueness of the right foot.

Family History.—Irrelevant.

Personal History.—She had suffered from measles and whooping cough in childhood. Until the age of nine years she had been subject to frequent attacks of tonsillitis. A tonsillectomy was then performed and she had had no further trouble with her throat. She had never had acute rheumatic fever, chorea, scarlet fever, diphtheria or any of the other acute infections. She was always a delicate child and at the age of twelve years began to suffer from cardiac attacks, characterized by præcordial pain, dyspnœa and palpitation; but not accompanied by swelling of the feet. These attacks at first were frequent, but later became less so and she was eventually able to secure a position as a stenographer, at which she worked regularly until her marriage in 1925. The appetite was always small; the digestion good, except for slight constipation. The menstrual periods began at the age of fifteen and were always regular and painless. There had been no pregnancies.

History of the Present Illness.—About April 25, 1928, she was forced to go to bed, owing to

the recurrence of one of her cardiac attacks. In addition to præcordial pain, dyspnœa, and palpitation, she complained of pain of a cramp-like character in the right foot and behind the right knee. Once too she had had transitory pain in the left foot. She denied having had any fever, sweats, or sore throats, and this was confirmed by her doctor. On May 13th, she was seen by Dr. C. P. Howard at her home, as she had had a sudden heart attack during which she lost consciousness. She was found in a pulseless condition, and had an apparent weakness of the right side of the face and a very much dilated right pupil. The heart was much enlarged and was fibrillating. The blood pressure was 102 systolic; the diastolic could not be read. She was given digitalin gr. 1/100 and morphia gr. 1/4, with such good effect that next morning she appeared to be in no distress, but she complained that the pain in the right foot and leg was worse. The face was symmetrical, the pupils equal, and the cranial nerves showed no evidence of paralysis. The fundi were clear. There were some remains of tonsillar tissue in the throat. The thyroid gland was not enlarged and there was no special pulsation visible in the neck. There was no lymphatic adenopathy. Over the tarsus of the right foot was a slight redness and it was slightly tender to palpation. None of the joints showed any changes. The skin was free from petechiæ and ecchymoses. The lungs were clear throughout to percussion, but a few medium moist râles could be heard over the bases. There was a slight præcordial fullness, but with no definite systolic retraction of the interspaces. The point of maximum impulse was best felt in the fifth interspace, 14 cm. from the mid line. No shock or thrill was felt. The relative cardiac dullness began at the second rib above and extended 16 cm. to the left and 2 cm. to the right of the midline. At

* From the Medical Clinic of Dr. C. P. Howard and the Pathological Laboratory of the Montreal General Hospital.

the apex the heart's action was rapid and irregular, in spite of which a definite presystolic crescendo murmur and a blowing systolic were detected. The latter was transmitted to the axilla and back. The pulmonic second sound was accentuated. The pulse was small, irregular in force and rhythm, and was so rapid that it could not be counted. The blood pressure showed a systolic reading of 100 and a diastolic of 80 mm. of mercury. The abdomen presented nothing abnormal, excepting that the liver was palpable two fingers' breadths below the costal margin. The spleen could not be felt. The reflexes were all normal. The temperature was 98.2°.

Under digitalis her cardiac condition improved, but the pain in the right foot and leg persisted. On May 16th a dusky red desquamation of the skin over the foot and toes appeared. On May 19th the condition became much worse, the pain being very severe; sensation was impaired and inability to move the toes occurred; finally definite gangrene of the foot set in. On May 28th, after much persuasion, she came to the hospital. The gangrenous process had by then extended up to the calf of the leg. The pain was extreme, requiring morphia for its alleviation. On two occasions prior to admission the urine examination showed a trace of albumin and of sugar, but nothing was seen microscopically.

Both the patient and her husband said that there had been no sudden onset to the pain in the right leg, and at no time was there any nausea or vomiting. Both agreed, however, that the pain, coldness and blueness of the right foot became much worse on May 19th.

On admission on May 29th the patient was very ill, she was very pale and was obviously suffering much pain. The heart was still fibrillating, but to a less degree. It was still markedly enlarged and the presystolic and systolic murmurs at the apex were well heard. A blowing systolic murmur was also heard over the pulmonic area. The right foot and lower half of the leg were gangrenous. A faint pulsation was still felt in the femoral artery, but none was present in the popliteal. In the next three days the gangrene extended somewhat, the patient remained in great pain and was often delirious. Her temperature ranged between 98° and 100.2° Fahrenheit. The blood

count revealed 3,850,000 red cells; 22,200 white cells; with hæmoglobin of 71 per cent (Hellige). The urine showed a trace of albumin and a few hyaline and granular casts, but no red blood cells. The blood urea, creatinine and sugar were all normal.

On June 1st, although it was considered practically hopeless, an amputation of the right leg through the middle third of the thigh was done. A thrombosis of the femoral artery was discovered which extended up to the site of operation. A fair amount of bleeding was noted from the profunda femoris. She stood the operation remarkably well, but on the following day a small area of bluish discolouration was noted over the skin of the left heel. The pulsations in the arteries of the leg and foot were well felt. From June 3rd to June 7th she progressed moderately well, although often irrational. The cardiac condition remained unaltered and there was no change in the left foot or leg.

On the night of June 7th she complained of a sudden severe pain across the whole lower abdomen. She was found in a state of collapse; the hands and feet were cold, the pulse barely palpable. A faint pulsation was detectable in the left femoral artery. There was extreme tenderness with some splinting over the whole lower abdomen, but nothing could be palpated. She was given morphine and next morning did not complain of any pain whatsoever. The pulsations in the vessels of the left leg and foot were well felt and there was no abdominal tenderness. A marked pulse deficit at the radial artery was noted, and digitalis was again administered. On June 9th she complained of some lower abdominal pain and, in addition, of pain in the left thigh, described as if something was pressing on it. The pulsations in the left foot and leg remained good and the area of discolouration had not increased. Until June 12th no change in the patient's condition was noted. She still complained of the pain in the left thigh and lower abdomen. The temperature ranged between 98° and 99.4° Fahrenheit. A blood count revealed 16,000 leucocytes. The urine on several occasions showed considerable albumin, a few hyaline and granular casts, and a few red blood cells.

On the morning of June 12th, she appeared

no outward signs of any great cardiac distress. Although problematical, it would seem possible that this attack was due to a sudden temporary obstruction of the mitral valve. It is unfortunate that a more detailed history of her previous cardiac attacks was not obtained; but owing to the gravity of her condition, the history was of necessity curtailed.

Aortic thrombosis. Thrombosis of the aorta is a relatively common occurrence, and perhaps the chief interest in such a finding is in the determination of its etiology. The etiology is briefly as follows: (1) embolism; (2) disease of the aorta; and (3) stasis. Welch⁷ and Hesse⁸ in their series of cases found that embolism was the greatest etiological factor. Aubertin⁹ on the other hand believes that an arteritis, either arteriosclerotic or luetic, is the chief factor. From a comparison of the large number of cases which at autopsy reveal severe arteriosclerosis of the aorta, with the very few cases showing an accompanying thrombosis, it would seem that an arteritis *per se* is a rare cause of aortic thrombosis. Stasis, too, cannot by itself result in a thrombosis, as Glenard and Baumgarten showed many years ago "that a stationary column of blood between two carefully applied aseptic ligatures will remain fluid for weeks." (Quoted from Welch⁷). In the combination of a diseased endothelium with slowing of the blood stream we have probably a very common cause of aortic thrombosis.

To again refer to Welch; in his series he noted the association of mitral stenosis with aortic thrombosis and in many cases no possible source of embolism could be discovered, and he felt that many of the cases, classified as embolic in origin, should rather have been typed as primary in nature. In conjunction with this, we would like to stress the fact that in our patient the aorta at autopsy showed marked atheromatous changes, although she was only thirty-three years old. We have not been able to discover whether atheroma of the aorta in cases of long-standing mitral stenosis occurs at an early age. If it is so, as in our case, an explanation of the thrombosis on the basis of an arteritis plus stasis would be logical. In our case, in spite of the obvious source of embolism, we believe that the thrombosis was most probably primary in origin.

The sudden increase in the signs and symp-

toms of circulatory obstruction in the right leg are explained by the autopsy findings, as obviously a portion of the iliac thrombosis must have become broken off and become lodged at a lower level in the femoral artery. The maintenance of a strong pulse in the arteries of the left foot and leg is peculiar in view of the autopsy findings, but Welch quotes Gendrin and Barie as having observed this phenomenon in several cases, which they explain on the basis of decreased tone in the arterial wall below the thrombosis, and state that at times the pulsations may be even larger than normal.

The presence of the straddle thrombus at the bifurcation of the aorta was thought probable, but, as the circulation in the left foot and leg was so well maintained, it could not be definitely diagnosed.

Renal artery thrombosis. Complete thrombosis of the renal artery is a rare occurrence and we could find only twenty-two cases reported in the literature. As these cases have been well reviewed from time to time by Halperin,¹⁰ Aschner,¹¹ Falci¹² and McKenna,¹³ we will not summarize the cases, but only give some of the most important points as regards the etiology and symptomatology.

The etiology is twofold; first embolism, and secondly damage to the renal artery, either by trauma or disease. Von Recklinghausen¹⁴ has reported the only case due to trauma, which was found at autopsy in a boy who some days previously had had a severe fall. Another rare cause of thrombosis is seen in the case of Renoy¹⁵ in which a girl while convalescing from scarlet fever was suddenly seized with severe pain over both lumbar regions, followed by anuria and death; both renal arteries at post mortem were completely thrombosed. Periarthritis nodosa was the cause in Manges and Baehr's case,¹⁶ while Bartels' case¹⁷ was due to an embolism following a tracheotomy for relief of a laryngeal diphtheria. The above cases, however, are curiosities, and in the majority of cases (15 out of 22) emboli in conjunction with rheumatic heart disease were the cause of the thrombosis, while in the remaining three cases, marked arteriosclerosis of the renal arteries was found.

The symptomatology of the disease, and that of any severe renal infarction not necessarily total, has been described as follows. The

patient in a majority of cases is seized with severe agonizing pain over the lumbar region, accompanied by nausea, vomiting and collapse. The pain occasionally radiates to the groin and genitalia. Tenderness and spasm of the overlying muscles occur, and, as Aschner points out, a very important feature is that at first the pain, tenderness, and muscular rigidity occur anteriorly, which may easily lead to a mistake in diagnosis. The character of the pain too is important, as from a maximum at the onset it persists for days, but gradually decreases in intensity. At no time does it tend to become colicky in nature. The pain is increased by pressure.

The urinary symptomatology is not striking, although there is usually an oliguria and in two cases an anuria occurred. The urinary findings are very variable. Albuminuria is, however, almost always present, but the occurrence of casts and red blood cells is very inconstant.

Halperin stresses the fact that obstinate constipation may attend these cases. Leucocytosis and fever are almost always present.

That the differential diagnosis is difficult is illustrated by the fact that Aschner's case was operated upon as a supposed perinephritic abscess. Makai¹⁸ reports a case of renal infarction in a fused kidney, which was mistaken for appendicitis. In Hewitt's paper concerning ball thrombi there is reported a case which, in addition to having a ball thrombus in the left auricle, had a complete thrombosis of the right renal artery. This case has naturally been overlooked by the other reviewers and so is briefly reported here. A woman of 36 years was admitted to the hospital suffering from very severe pain in the right lower quadrant of the abdomen. This pain had commenced suddenly two days previously. She gave a history of an attack suggesting acute rheumatic fever some years before, and on examination a well marked mitral stenosis was discovered. The abdomen was slightly distended, the muscles of the right lower abdomen were in spasm, and there was marked tenderness. The urine boiled practically solid and revealed a few casts but no red cells. Temperature was 99.5° F. and the leucocytes 16,800 per c.mm. The diagnosis of appendicitis was made, and an operation performed which revealed nothing abnormal. She died a few hours later, and, at

autopsy, the presence of a complete thrombosis of the right renal artery with necrosis was found.

The diagnosis in our case was not made, nor was it suspected, although it was thought probable that she had had a small renal infarct. There are three possibilities for the occurrence of the thrombosis; first, it may have occurred without symptoms sometime prior to death; secondly, it may have occurred simultaneously with the mesenteric thrombosis; and thirdly, the severe lower abdominal pain complained of by the patient six days before death may have marked the onset of the thrombosis. The first conjecture seems improbable, as the only two cases in the literature who failed to give any history of a sudden pain were suffering from marked arteriosclerosis and both died of uræmia. From the appearance of the infarct and kidney it would seem that the thrombosis was of longer duration than two days and therefore could not have occurred simultaneously with the mesenteric thrombosis. I am therefore inclined to believe that the unexplained abdominal pain occurring six days before death was due to the blocking of the right renal artery by an embolus.

As the diagnosis was unsuspected the urine output was not carefully watched so there is no record available to tell us whether or not there was an oliguria. The temperature did not show any rise but the urine did show albumin and casts and a few red blood cells.

Mesenteric thrombosis. There is no need to discuss mesenteric thrombosis, other than to say that, in such a patient, where there was evidence of marked rheumatic heart disease in which there had already been symptoms suggesting embolism, the diagnosis was not difficult.

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A SERIES OF URETERAL CALCULI TREATED BY MANIPULATION*

BY WALTER P. HOGARTH, M.B., F.A.C.S.,

Urologist, McKellar General Hospital,

Fort William, Ont.

IN this paper it is not my intention to enter into a discussion of the composition or causes of renal and ureteral calculi. I shall confine myself to a presentation of my findings and observations in a series of ureteral calculi treated by manipulation.

My series consists of 40 cases of calculus in the ureter, concerning 36 patients; two persons being treated for two different stones and one for three.

Twenty-one of these patients were male and 15 female. In 3 of the female cases the first onset of severe colic was a few days after a confinement.

The age incidence is younger than that usually given, probably on account of the low average age of the inhabitants of our locality. The youngest patient was 23 and the oldest 61. There were 12 patients under 29, 9 between 30 and 39, 9 between 40 and 49, 4 between 50 and 59, and two over 60.

The right side was involved in 23 cases and the left in 17. An interesting fact is that not one of these patients had had the appendix removed for the pain. I feel that this speaks well for the diagnostic ability of the men of our locality in general practice.

Thirty stones were in the lower ureter, seven in the mid ureter, and three in the upper ureter. Co-existing calculi were present in three cases. One patient had a large calculus in each kidney as well as one in the ureter. One patient had had a nephrectomy for pyonephrosis with calculi formation a short time before. One patient had a large bladder calculus. Three patients gave

histories of having passed calculi earlier, and one of these had had a large calculus removed from the bladder forty years previously.

During the period of this series only four other cases of calculi were seen, two large kidney calculi, and two large ureteral. One of these I removed by open operation, and the other was removed elsewhere.

Bifurcation of the right ureter was detected twice. In one case the bifurcation took place just below the pelvis, and in the other just above the bladder.

The shadow of the calculus was detected by the x-ray in 35 cases. No shadow was detected on examination of the film before and after treatment in three cases representing five stones. These patients had typical attacks of colic, the obstruction was felt by the catheter and the calculus recovered in four, and was felt to pass in the fifth.

A few of the patients were seen in their first real attack of renal colic, but most gave a long history of pain and had lost count of the number of attacks.

Blood and albumin were very constant findings. The hæmaturia varied from gross hæmorrhage in two cases to a few cells detected only by microscopic examination. In only four cases were no blood cells found. Twenty cases gave a positive reaction for albumin.

The incidence of infection was low, only one severe case being encountered. This occurred during treatment and will be referred to later. Half of the cases showed a few pus cells, but only three needed treatment, (other than routine medication) for infection.

The diagnosis was made on the patient's history, (which was that of typical colic in all but

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one case) combined with x-ray and urinary findings. The unusual case was one in which the patient had been complaining of a dull aching pain in the right side for some time. Her physician had a gall bladder condition in mind but wished her urinary organs checked up first. A cystoscopic examination revealed a bifurcation of the ureter with the stone in one branch just below the bifurcation. She was spared real attacks of colic by the patency of the other branch of the ureter.

A brief account of some of the most interesting cases is given herewith.

CASE 1

Male, aged 26, complaining of repeated attacks of right-sided colic for six months. He was cystoscoped at a large clinic and told that there was nothing wrong. X-ray showed a shadow near the middle of the ureter. Urine: albumin, trace; red blood cells, a few. Cystoscopy. The right side of the trigone was elevated and congested, the orifice retracted. An F6 catheter met an obstruction 8 cm. up, and, on being manipulated past, there was a steady flow of urine from the catheter. The ureter was dilated to F12. An F6 catheter was left in place for twenty-four hours. He passed the stone six days later. Moderate pyelitis. The pelvis was lavaged twice with 5 per cent neosilvol. There has been no trouble since.

CASE 2

Mr. C., aged 48, having repeated attacks of left renal colic. X-ray showed a shadow in the lower left ureter. He was cystoscoped during an attack of colic. The urine was under tension. The ureter was dilated to F12. He passed a stone four days later.

CASE 7

Male, aged 44, with attacks of colic every two to three days for nearly a year. X-ray showed a suspicious shadow in lower end of the left ureter. Cystoscopy. An F6 catheter passed; left in the ureter for twenty-four hours. One week later he passed the stone. Thirteen months later on he took an auto trip in the east and had severe colic. X-ray showed a shadow in the mid region of the left ureter. Open operation was advised. He returned home. Had two dilatations two weeks apart, and one week later passed the stone.

CASE 9

Male, aged 44. He suffered with attacks of colic about every hour for five days with marked vomiting. X-ray showed no suspicious shadows. Urine, negative. Cystoscopy. A very small orifice, marked edema and inflammation around the left orifice. An obstruction was met 4 cm. from the orifice. The orifice was slit with scissors and the ureter dilated to F12. He passed a calculus two days later. In May, 1929, he reported no trouble since and has been in the best of health.

CASE 11

Male, aged 54. His first attack of colic occurred eleven years previously. He had had several attacks and passed a stone three years ago. This attack started October 3rd, and he had been in constant pain since with marked strangury. X-ray negative. Urine: albumin, trace; red blood cells a few; pus cells a few. Cystoscopy, October 11th. The left orifice was normal.

The region of the right orifice was prominent. A catheter was passed up the ureter with difficulty. A stereo-x-ray, with catheter, showed no sign of a stone. October 12th, the catheter was removed. No pain. He passed a stone two days later. In May, 1929, he reported that he had passed a stone this month after a few mild attacks of pain.

CASE 14

Female, aged 41, who had suffered from attacks of colic associated with belching and headaches. She was treated as a gall-bladder case. X-ray showed a shadow in the region of the ureter opposite the 3rd lumbar vertebra. Two dilatations were performed a week apart. She passed the stone, which measured 0.8×0.6 cm. In May, 1929, she reported in excellent health.

CASE 15

Male. He had had renal colic almost continuously for a week before admission. X-ray showed a small calculus in the lower right ureter. January 31st, cystoscopy. Intense congestion found around the right orifice. Lower ureter dilated to F12. An F8 catheter was left in the ureter. The urine was under tension. Shortly after removal of the catheter, the next day, he had a burning sensation in the urethra and felt something pass while urinating. February 3rd. X-ray negative. On May, 1929, he reported having had no trouble since.

CASE 16

Male, aged 37. Two attacks of very severe colic, with passage of blood. Urine: albumin, negative; a small amount of blood. X-ray showed a suspicious shadow in the region of the lower end of the right ureter. Cystoscopy during the attack. The bladder was negative; very small orifices. An F6 catheter was passed by the stone and left in place for twenty-four hours. No pain. He was discharged. A few days later he passed an irregular calculus, 1.1×0.7 cm. May, 1929, he reported no further trouble.

CASE 24

Male, aged 35. He had had seven different attacks of colic before admission. X-ray showed two shadows in the region of the lower end of the right ureter. Urine: albumin, marked; a few pus cells and red blood cells. Cystoscopy, July 8th. Congestion around the right orifice; left, normal. An F6 catheter was passed. An obstruction was felt and the catheter was left in the ureter for twenty-four hours. He passed one stone on the night of the 10th and another on the morning of May 11, 1929, he reported no trouble since.

CASE 28

Mrs. Z., aged 32. Her attack of colic occurred during her fifth pregnancy; several attacks during the year on the left side. Urine: albumin, plus plus; red blood cells, occasional. X-ray showed two shadows in the line of the upper left ureter. December 29, 1928, the left orifice was very small. An obstruction-felt 13 cm. up the ureter. An F5 catheter was passed and left in the ureter for twenty-four hours; slight pain. January 4, 1929. The ureter was dilated to F8; the calculus was felt 8 cm. up the ureter. January 14, 1929. Ureter dilated; orifice to F10. A calculus was felt 5 cm. up the ureter. January 15, 1929, discharged. Three weeks after leaving the hospital, after slight pain, she heard the stone hit the toilet while urinating. One week later she passed a second stone painlessly. The stone measured 1.0×0.7 cm. May, 1929, she reported no symptoms.

CASE 29

Mr. S., aged 33. First attack of colic on the left side. X-ray showed a shadow in line with the third lumbar vertebra. Urine: a few red blood cells. Cystoscopy. The bladder was clear; a very small left orifice. The lower end of the orifice was dilated to F9. An F6 catheter met some obstruction well up the ureter and was eventually manipulated past. A very free flow of urine from the catheter followed. The catheter was left in the ureter for twenty-four hours. Five days later a severe attack of colic, with strangury occurred. Cystoscopy showed a stone partially protruding from the meatus. It was removed with cystoscopic forceps.



Showing some of stones recovered by this method. The rule is marked in centimetres.

TREATMENT

We are all agreed that many ureteral calculi will pass unaided, but we do not agree on the length of time they should be permitted to remain undisturbed. Calculi giving repeated attacks of pain may cause considerable destruction of kidney tissue, or may become so firmly imbedded in the ureteral wall that they are difficult to remove even by open operation. I believe there are three clear indications for manipulative interference: (1) infection (slight or moderate); (2) arrested progress, that is, a non-advancing stone, as shown by x-ray; (3) attacks of pain which cannot be readily controlled.

I depend on ordinary ureteral catheters, bulbs and filiforms, to dilate the ureter. I am, frankly, afraid of the metal inventions for grasping or loosening the stone. I have tried several times without success the method advocated by Bumpus of inserting several filiforms around the calculus and withdrawing them together. On one occasion I had an F6 opaque catheter and five filiforms past a stone and after twisting them began

to draw them out. There was considerable resistance, apparently indicating that I had secured the stone. I did not recover the stone and on inspecting my catheter found that it had been cut through at the eye. I could see no sign of the piece of catheter in the bladder and rightly presumed that it was in the ureter. I was much perplexed but succeeded in getting another catheter past the obstruction and with drainage from the kidney established, decided to wait and watch. The patient had some pain in the side the second night and during a bowel movement felt a twinge in his urethra. X-ray in the morning showed that both the stone and the piece of catheter had disappeared.

I feel that there is nothing to be gained by permitting a patient to suffer that worst of all pains, renal colic, and if morphine does not control the pain I advise ureteral dilatation. Believing that the most important factor in the pain is the tension in the pelvis, I concentrate on its reduction, that is to say, my first endeavour is to get a catheter of any size whatever past the offending stone. This is not always easy, but by repeated attempts, varying the size of the catheter and shape of the tip used, one is rewarded eventually with success. Two results are immediate. The first is the almost instantaneous relief from severe pain. Patients will express relief during the first few seconds after the catheter has passed the stone. The second is the relief from tension of the urine above the stone. The urine often pours from the catheter. I have recovered as much as three ounces from a distended pelvis and ureter. The procedure following the relief of tension varies with the existent conditions. Leaving the original catheter in position, I usually try to pass an additional one past the stone. If I am successful I rest content. In most of these cases, however, the ureteral orifices are so small that a second catheter will not enter. It is then necessary to remove the original catheter and insert catheters of increasing size, passing each one by the stone if possible. In seven cases only did I find it necessary to enlarge the ureteral orifice with scissors. In these cases the bleeding was negligible. A moderate amount of pressure can be used with safety on the catheters, which, with a rotary movement, aids their passage. My greatest difficulty has been with stones impacted in

the lower end of the ureter. Here it is hard to get enough of the catheter into the ureter to get much leverage. I have used both the bulb and tapered catheters as well. I find the tapered catheter of great value, especially in securing a good dilatation of the lower ureter. I try to secure a dilatation up to at least F10 and then insert a catheter well past the stone. This catheter is left in the ureter for twenty-four hours and then withdrawn.

Meanwhile the patient is given plenty of fluids. For medication I give twenty grains of potassium citrate and ten minims of tincture of belladonna every four hours. Morphine is rarely indicated. This is often all that is necessary. There is marked relief from pain and free drainage is established. On two occasions I have had the stone come away attached to the catheters and several have passed their stones a few hours after the withdrawal of the catheters.

A second dilatation is not given for several days, unless severe symptoms recur. If they do recur dilatations are repeated at four- to ten-day intervals, depending on the severity of the symptoms and the condition of the patient.

It is not necessary to hospitalize the patient constantly. Most cases requiring additional dilatations return to the hospital the morning of the treatment and leave the next day after the removal of the catheter.

Most women can be manipulated without anæsthesia. For men I have used general anæsthesia, caudal, and novocain in the urethra. Unless there are contra-indications I prefer general anæsthesia for the first manipulation. Caudal anæsthesia has not been satisfactory except in a few cases. For subsequent dilatations anæsthesia is rarely required.

INFECTION

Some writers have stressed the dangers of infection in connection with manipulative measures. While I admit the possibility of infection, I feel that it has been over emphasized. We are all familiar with the use of an indwelling catheter and of ureteral dilatations in the treatment of renal infections. We have in the method above described a means of treating ureteral stones even in the presence of a considerable degree of infection. Unless the infection present is of such a character that nephrectomy is the

obvious treatment I believe that manipulation should be tried. In this series there was only one case, and that an early one, where additional infection may have been introduced. This patient's history is instructive. By a series of three dilatations the stone had been gradually persuaded down to a point near the meatus, when one day severe pain and a temperature of 104° developed. I immediately cystoscoped her, and, getting a catheter by the stone, obtained two ounces of foul-smelling urine. I then lavaged her pelvis with normal saline and neosilvol. This was repeated several times through the indwelling catheter and in a few days her temperature was normal and the infection under control. Some days later I slit the orifice but, failing to recover the stone, I decided to operate. As x-ray and examination had shown that the stone was just at the meatus, we went through the bladder and slit the orifice widely. No stone was found. The orifice was left wide open, the bladder sewn tightly, and drained by an indwelling catheter. Convalescence was uneventful. An x-ray showed no sign of the stone. It had been passed unnoticed between the time of the x-ray and the operation the next day. A year later this patient developed pain in the right side. Her physician felt that it was due to gall stones, but asked me to see her. I agreed with him, but asked permission to check up on her former trouble. The orifice had healed nicely; function was good; the pyelogram was satisfactory; and there was no evidence of infection. Operation confirmed the diagnosis of gall stones.

In another case, also early, operation by the inguinal route was performed. During demonstration of the stone, it was inadvertently pushed through the meatus into the bladder.

Among the lessons learned from these cases were, first, that even fairly large stones may pass undetected; and, second, that the only x-ray picture to be depended upon for locating a ureteral stone is one taken on the way to the operating room or, better still, on the operating table.

In this series the size of the stones varied from the size of a small split pea to slightly more than a centimetre in diameter.

Ureteral stones may become lodged in any part of the ureter. The majority, however, are found in the lower two inches. Stones become

rices; or cette crèche canadienne anglaise de Montréal avait, il y a à peine dix ou douze ans, un taux de mortalité s'élevant jusqu'à 75 pour cent.¹ Plus récemment, M. Lesné,² de France, ne prétendait-il pas que la mortalité des nourrissons hospitalisés s'élevait encore à 35 pour cent. Or, quand on pense à la minutieuse organisation scientifique des crèches françaises, où, de plus, la plupart des enfants, même les enfants illégitimes, y entrent avec leur mère et y reçoivent l'allaitement maternel auquel ils ont droit, peut-on être surpris des statistiques de nos crèches où pour ne pas parler d'autre chose, l'allaitement maternel est forcément inconnu? Nous ne sommes donc qu'une dizaine d'années en retard sur nos voisins, et, si nous hâtons, nous devancerons probablement nos lointains amis, au moins quelques-uns d'entre eux, car un grand nombre de crèches françaises n'ont que 4 et 5 pour cent de mortalité infantile.³

Si la solution, si importante pour nous, du problème des crèches est en retard dans la Province de Québec, c'est tout probablement parce que nous nous sommes laissés hypnotiser par les déclarations pessimistes de savants étrangers prononcées il y a quelques années, dans le temps où, précisément, le problème paraissait insoluble. tellement insoluble que le monde médical le plus averti semblait alors croire que les nourrissons hospitalisés mourraient à peu près tous d'une maladie unique à laquelle on avait donné le nom de "Maladie des Crèches."

Les observations sans nombre que nous avons faites depuis trois ans à la Crèche d'Youville nous ont amenés à des conclusions nombreuses, mais surtout, nous sommes aujourd'hui en mesure d'affirmer: premièrement, que les nourrissons hospitalisés dans une institution ne meurent pas d'une maladie qui soit propre à cette institution, et que la maladie des crèches, en tant qu'entité morbide, est un mythe; deuxièmement, que les crèches ne diffèrent, en somme, du milieu familial que parce qu'elles constituent une agglomération où les individus, tout particulièrement susceptibles, sont plus souvent exposés aux dangers des différentes maladies infectieuses et contagieuses; troisièmement enfin, que, aujourd'hui que l'on comprend parfaitement le problème alimentaire infantile, les statistiques des crèches dépendent exclusivement des mesures qui seront prises contre toute une série de maladies dites évitables, telles que la diphtérie sous différentes

formes, la rougeole, la coqueluche, la scarlatine, l'influenza et quelques autres.

Ce serait tout de même une erreur grave, parce que ce serait aller à l'encontre des faits, de prétendre que le problème gastro-intestinal n'existe pas ou n'existe plus chez les enfants hospitalisés. Au contraire il existe. Et même si la gastro-entérite, ou tout ce que l'on croyait autrefois être de la gastro-entérite, paraît être disparue de chez nous, elle reste quand même comme une menace constante qui tient le personnel médical et hospitalier sur le qui-vive, dans la crainte de voir se déclarer une de ces épidémies meurtrières de dysentérie qui décimaient, il y a quelques années, une grande partie de la population infantile de la Crèche d'Youville. Mais le point est celui-ci. En dehors, au dessus du problème alimentaire, il existe un problème qu'il faut absolument résoudre si on veut abaisser le taux des statistiques des crèches canadiennes-françaises, c'est le problème infectieux. On n'a jamais, je crois, insisté assez sur ce côté fort important de la question. On peut constater par le graphique No. 1 que le taux de mortalité de la Crèche d'Youville a été abaissé considérablement du premier janvier 1926 au premier janvier 1929. Or bien que nous n'ayons pas eu à enregistrer un seul cas de décès par choléra infantile depuis deux ans au delà, et bien que le nombre de décès dus à des troubles gastro-intestinaux ait été réduit à un minimum (22 en 1928 contre 250 en 1925), le taux de notre mortalité n'est pas descendu plus bas que 36 pour cent. Bien plus, on peut également constater par le même graphique que nos statistiques ont tendance à remonter un peu cette année. Cet arrêt et le commencement d'ascension de la courbe de notre mortalité sont dus à ce qu'il nous a été impossible de débarrasser la Crèche d'Youville des maladies infectieuses diverses, dont l'issue la plus fréquente chez les nourrissons, est, comme on sait, une complication des organes respiratoires. En 1928 une quarantaine de nos décès sont survenus chez des prématurés débiles, dont un bon nombre auraient pu survivre s'ils n'avaient pas eu à souffrir, comme les autres enfants de l'institution, d'une infection des voies respiratoires.

En résumé, la "Maladie des Crèches," c'est l'ensemble des maladies congénitales ou acquises, dont souffrent et dont meurent les enfants hospitalisés; la débilité congénitale, les troubles

gastro-intestinaux, les maladies infectieuses en général, les maladies des organes respiratoires en particulier, et quelques autres. A cela il convient d'ajouter quelques maladies qui, sans être fatales en soi, prédisposent l'enfant à d'autres infections plus graves en l'affaiblissant, ou qui, sans comporter quelques gravité que ce soit, entravent le travail du personnel, et constituent le sable dans l'engrenage.

Nous allons étudier en détail les causes de décès pour l'année 1926, date à laquelle le personnel de la Crèche d'Youville a commencé à s'organiser. (Voir Tableau).

TABLEAU

Causes des Décès Pour l'Année 1926, à la Crèche d'Youville

DÉBILITÉ CONGÉNITALE:

- (a) Dûe à accouchement provoqué;
- (b) Dûe à des malformations congénitales;
- (c) Dûe à la syphilis héréditaire.

DIARRHÉES:

- (a) Diarrhées non-infectieuses;
- (b) Diarrhées infectieuses:
 - (a) Diarrhées infectieuses franches;
 - (b) Diarrhées infectieuses symptomatiques.

Bronchopneumonies dues à:

- (a) Rougeole;
- (b) Coqueluche;
- (c) Influenza;
- (d) Rhino-pharyngites;

Autres causes:

- (a) Diphtérie;
- (b) Scarlatine;
- (c) Méningites;
- (d) Varicelle;
- (e) Erysipèle;
- (f) Vulvo-vaginites gonococciques;
- (g) Abcès multiples;
- (h) Rachitisme et tétanie.

Toutes ces maladies constituent ce que l'on a appelé "Mal des Crèches."

Maladies soulignées d'un trait, celles dont nous nous sommes débarrassés, mais qui sont sujettes à révenir; de deux traits, celles dont nous nous sommes débarrassés définitivement; de trois traits, celles qui existent encore à l'état endémique.

PRÉMATURÉS DÉBILES

Le "birth control" n'as pas chez nous la popularité qu'il semble avoir ailleurs. Les lois civiles et surtout les lois religieuses défendent l'avortement provoqué. La plupart des jeunes filles n'osent pas enfreindre ces lois,

et très peu de médecins, en somme, se livrent à l'exercice de cette pratique médicale criminelle. Mais, pour sauver une réputation, on a trouvé moyen de contourner les difficultés légales ou morales, on n'avorte pas mais on provoque un accouchement avant terme vers le sixième ou septième mois. C'est ce qui explique le nombre relativement élevé de prématurés débiles que nous relevons dans les crèches, telles que la Crèche d'Youville. Je ne me sens pas le courage de m'élever contre cette pratique, parce qu'en somme, la réputation d'une jeune fille vaut bien qu'on ait recours à quelques subtilités. Mais d'autre part, ces subtilités contribuent à élever de quelques points nos statistiques déjà hautes.

MALFORMATIONS CONGÉNITALES

Les malformations congénitales sont relativement rares chez nous. D'ailleurs elles résultent de contingences qui nous échappent complètement.

SYPHILIS HÉRÉDITAIRE

La syphilis héréditaire, si on se fie aux auteurs les plus connus, est une maladie très fréquente chez les enfants hospitalisés. Il y a eu des volumes entiers d'écrits sur cette question. On a énuméré une série presque infinie de symptômes variés qui seraient la signature de la syphilis congénitale:—

"Le coryza précoce et rebelle"; la "mégalo-splénie"; la "tuméfaction des testicules, accompagnées ou non d'hydrocèle"; l'"ulcère de l'ombilic"; la "croissance lente"; le "poids stationnaire"; les "hémorragies du nouveau-né", les "malformations surtout multiples"; le "mongolisme"; la "maladie bleue"; les "affections cardiaques"; un "ictère physiologique trop prolongé ou trop intense"; l'"hypertrophie du thymus"; les "cris incessants"; le "crâne natiforme"; le "développement anormal des bosses pariétales"; la "saillie de l'écale du frontal"; la "voûte ogivale"; un "crâne épais contrastant avec des membres graciles"; le "front olympien"; le "rachitisme précoce"; le "craniotabes"; la "dilatation veineuse péri-crânienne"; les "végétations adénoïdes précoces"; les "convulsions"; tout "syndrome méningé"; l'"hydrocéphalie"; "nombre d'encéphalopathies"; les "lésions généralement attribuées à un traumatisme obstétrical"; "les cheveux rouges"; l'"hémiplégie spasmodique infantile"; le "syndrome de Little"; les

“displégies cérébrales”; les paralysies bulbaïres”; le “strabisme convergent définitif”; la “cataracte congénitale”; la “surdi-mutité”; la “débilité congénitale”; l’“anorexie”; l’“intolérance aux différents laits”; les “vomissements habituels”; les “anémies”; les “entérites qui surviennent sans fautes alimentaires grossières”; les “bronchites à répétition”; le “prurigo”; le “strophulus”; les “enfants qui naissent pesant plus de neuf livres”; “gémellité univitelline”; enfin, “tout enfant au dessus ou au dessous du poids normal.”⁴

Cette énumération molièresque démontre que la tendance générale du corps médical était de soupçonner ou d’incriminer la syphilis héréditaire toutes les fois que l’on se trouvait en face d’un syndrome dont quelques-unes des données nous échappaient. Il va sans dire que les statistiques sur la fréquence de la syphilis héréditaire étaient extrêmement élevées. On a même prétendu que 55 pour cent des enfants illégitimes en étaient atteints. Mon collaborateur et ami, le Dr. Albéric Marin, a été traité de réactionnaire pour n’avoir trouvé que 12 pour cent d’hérédos à la Crèche d’Youville dans une enquête qu’il y a faite en 1924. J’ignore combien de syphilitiques la Crèche d’Youville a admis en 1924, mais ce que je sais, c’est que depuis 1926 jusqu’au premier janvier 1929, sur plus de 2,000 admissions, nous n’avons trouvé que 9 cas d’hérédos-syphilis prouvée ce qui nous donne un taux de moins de 1 pour cent.

Il peut se faire que quelques hérédos soient morts quelques jours ou quelques semaines après leur admission, avant qu’un diagnostic positif n’ait été établi, et il peut se faire aussi que la campagne d’hygiène préventive qu’ont menée depuis 1920 les différents gouvernements, et le nôtre en particulier, ait donné des résultats encourageants, et le Dr. Desloges, directeur de la division des maladies vénériennes du Service Provincial d’Hygiène, mérite à ce sujet la reconnaissance du public, mais on est loin des 12 pour cent de mon ami Marin, et encore plus des 55 pour cent de certaines statistiques françaises. D’ailleurs, tout récemment, aux Etats Unis, sur 1,000 enfants abandonnés, dont plus de 50 pour cent sont illégitimes, on n’a trouvé que 20 cas de syphilis héréditaire, 19 parmi les enfants légitimes, et 1 parmi les enfants illégitimes.⁵ Il est évident que l’on a considérablement exagéré cette question de syphilis héréditaire.

Et trois années d’expérience dans une crèche de l’importance de la Crèche d’Youville nous permettant de conclure qu’il va falloir penser à d’autres maladies qu’à l’hérédos, si on veut résoudre le problème de nos crèches. Que la débilité congénitale soit due à une cause ou à une autre elle requiert des soins spéciaux qu’il nous a été impossible jusqu’ici de donner à nos prématurés. Ce problème est aujourd’hui à l’étude.

PROBLÈME ALIMENTAIRE

Diarrhées.—L’étude que nous avons faite du problème alimentaire durant les trois années passées à la Crèche d’Youville nous a fourni des renseignements de la plus haute importance.

La diarrhée ou, plutôt, les diarrhées étaient responsables à elles seules de plus du tiers des décès. De plus, on peut dire qu’il était à peu près impossible, il y a quelques années, de trouver dans les crèches un enfant dont la digestion fût normale en tous points, et dont la courbe de croissance fût régulière. Tous vomissaient, pas un d’entr’eux n’avait des selles normales. Un grand nombre mouraient de troubles diarrhéiques. Et, chose curieuse, les auteurs les plus réputés des meilleures écoles du monde semblaient prétendre que ces troubles divers et variés ne pouvaient dépendre ou que d’une suralimentation, ou d’une infection intestinale causée par un lait contaminé. A la suite d’expériences post mortem, faites sur des “organes morts”, on avait constaté que l’estomac d’un enfant de quinze jours, par exemple, ne pouvait contenir plus d’une once de liquides. En répétant les expériences et les recherches on était arrivé à fixer des rations alimentaires qu’il ne fallait jamais dépasser sans faire courir des risques graves à l’enfant. D’autre part l’examen bactériologique du lait de vache ayant révélé la présence de germes pathogènes nombreux, on a conclu que toutes les diarrhées dont souffrent les nourrissons devaient être dûes nécessairement à une infection du tube gastro-intestinal par un lait ou un aliment contaminé.

Dans un cas comme dans l’autre, d’ailleurs le traitement était le même; cessation de tout aliment et diète hydrique absolue ou à peu près, (pour laisser reposer les organes digestifs fatigués par une trop forte alimentation), laxatifs violents (pour débarrasser l’intestin des microbes apportés par le lait). On ne semblait

faire aucune différence entre certains troubles digestifs non-infectieux et les troubles digestifs causés par une infection. Variot, en France, a eu beau parler durant vingt ans des dangers de la sous-alimentation; personne ne le prenait au sérieux. Et ce n'est que vers 1920 que l'on a paru s'apercevoir que les troubles diarrhéiques infantiles pouvaient être groupés en deux catégories: (1) les diarrhées non-infectieuses; (2) les diarrhées infectieuses.

Diarrhées non-infectieuses.—Grâce aux constatations précises qu'ont permises les études nombreuses faites sur le métabolisme, aux Etats Unis et ailleurs, on est vite arrivé à pouvoir fixer un régime diététique infantile en se basant, non pas sur des données physiques et anatomiques (fausses la plupart du temps parce qu'elles étaient prises sur un cadavre et non sur organe ou sur un système digestif vivant), mais en se guidant sur les besoins physiologiques de l'organisme de l'enfant. Tout le problème alimentaire se trouvait pour ainsi dire résolu. On n'a plus maintenant qu'à donner à un enfant une ration alimentaire suffisante et complète, et s'il ne souffre pas de maladies congénitales rares, ou d'infection, il n'y a aucune raison pour que cet enfant ne progresse pas. En résumé, les rations alimentaires calculées selon les anciennes méthodes sont inadéquates parce qu'elles sont insuffisantes.

Il va sans dire, par ailleurs, que pour l'enfant, l'aliment le plus complet est le lait maternel. C'est pourquoi les crèches devraient pouvoir se procurer du lait humain au moins pour alimenter leurs enfants malades, leurs débiles et leurs prématurés.

Diarrhées Infectieuses.—Ici aussi des progrès considérables ont été réalisés. Tous les auteurs sérieux faisaient remarquer que les lésions anatomiques intestinales faisaient défaut chez un grand nombre d'enfants morts de troubles diarrhéiques. Bien plus, M. Maurice Renaud,⁶ entr'autres, dès 1921 attirait l'attention du public médical sur la fréquence des mastoïdites insidieuses du nourrisson, et prétendait que les "états infectieux" dont elles sont une complication très grave jouaient un rôle considérable dans la pathogénie du premier âge. Et sur 72 enfants morts d'athrepsie, et chez qui aucune lésion intestinale n'avait pu être relevée, M. Renaud a découvert dans 100 pour cent des cas, une mastoïdite double qui était passée

inaperçue durant la vie. Un peu plus tard M. McKim Marriott,⁷ de St. Louis aux Etats Unis, dans un travail de synthèse extraordinairement intéressant, prétendait qu'un grand nombre de troubles que l'on avait jusque là attribués au système digestif, étaient dus à des lésions infectieuses situées bien souvent très loin de l'intestin, dans le rein par exemple, mais la plupart du temps dans l'oreille moyenne et la mastoïde.

A la suite de plus de 100 nécropsies pratiquées sur des enfants morts à la Crèche d'Youville, de troubles diarrhéiques, nous sommes, nous-mêmes, arrivés aux conclusions auxquelles sont arrivés ces deux chercheurs distingués, et nous sommes en mesure de pouvoir affirmer que les diarrhées, chez nous du moins, étaient dues, d'une part, à une infection directe de l'intestin probablement par un produit alimentaire contaminé, et d'autre part, à une toxi-infection généralisée dont le foyer infectieux le plus fréquent était dans l'oreille moyenne et la mastoïde.

Nous avons donc eu à faire face à (a) des diarrhées infectieuses franches, et (b) des diarrhées infectieuses symptomatiques.

Diarrhées franches.—On groupe dans cette catégorie toutes les diarrhées dues à une infection du tube intestinal. Les diarrhées de l'été sont de ce nombre. Ce sont, dans l'énorme majorité des cas, des diarrhées aiguës ou suraiguës.

Les diarrhées demandent un traitement très précis qui se montre d'ailleurs d'une efficacité des plus encourageante. Certaines d'entr'elles guérissent si on met l'enfant à un régime diététique riche en hydrates de carbone (le "high carbohydrate diet" des auteurs américains); d'autres ne guérissent que si on se sert de laits écrémés acidifiés ou, plus fréquemment, de laits albumineux. Toutes peuvent être prévenues par une bonne stérilisation des aliments ou une pasteurisation bien faite du lait. Et c'est sûrement dû à une étroite surveillance de ce côté que le choléra infantile est disparu de la Crèche d'Youville, à tel point que les mois d'été sont précisément les mois où notre mortalité est la plus faible.

Diarrhées symptomatiques.—Ce groupe renferme une série de troubles diarrhéiques subaigus ou chroniques. La diarrhée symptomatique dure plusieurs jours et souvent

plusieurs semaines et mène l'enfant à l'hypothrepsie et à l'athrepsie. La plupart des maladies infectieuses, sinon toutes, s'accompagnent de diarrhée qui ne disparaît que quand la maladie initiale est guérie.

Maurice Renaud a montré toute l'importance des otites et des mastoidites dans la pathogénie des diarrhées du nourrisson. Chez nous, à la Crèche d'Youville, en 1926 et surtout en 1927, mon ami, le docteur Philippe Panneton,⁸ notre oto-rhinolaryngologiste, a opéré près de trois cents cas de mastoidites latentes. Cela lui a permis de perfectionner une technique opératoire qui fait de l'antrotomie une opération mineure en en réduisant le temps à environ cent secondes.

Devant la tenacité de l'infection rhinopharyngée, dont nos otites et nos mastoidites nombreuses étaient des complications, nous avons été forcés d'en rechercher la cause bactériologique, et nous avons découvert, dans les sécrétions séropurulantes du nez et de l'arrière-gorge de nos malades tout aussi bien que dans le pus des oreilles et des mastoïdes, la présence de bacilles diphtériques virulents et pathogènes.⁹ Une immunisation active contre la diphtérie faite avec un mélange de toxine-antitoxine, et plus tard avec l'anatoxine et pratiquée chez tous nos nourrissons âgés de 4 mois ou plus, a réussi à débarrasser la Crèche d'Youville non seulement de la diphtérie clandestine qui la ravageait, mais des otites et des mastoidites latentes dont un si grand nombre de nos enfants souffraient. Je ne suis pas prêt à avancer que l'otite latente qui est si souvent la cause de l'athrepsie, soit toujours dûe à une infection diphtérique ignorée, mais la disparition de l'athrepsie, de même que la disparition de l'otite latente (que nous ne rencontrons maintenant qu'une fois de temps en temps) ont tellement coïncidé avec la disparition du coryza purulent, qui, lui-même, n'est disparu qu'au fur et à mesure que la vaccination antidiphtérique se faisait, que je suis convaincu qu'il n'y a aucun espoir de voir diminuer le nombre d'athrepsiques dans nos crèches si on n'essaie pas de tarir la source d'infection diphtérique qui semble les infecter. Cette source d'infection est alimentée par les enfants déjà contaminés, et deuxièmement par les porteurs de germes qu'il faut absolument rechercher, surtout parmi les membres du personnel qui ont vécu depuis longtemps dans ce milieu.

En résumé, le problème alimentaire semble être résolu chez nous parce que l'on donne aux enfants une alimentation suffisante et complète; on prévient les diarrhées en ne donnant que des aliments purs; enfin, on prévient les différentes maladies infectieuses, qui sont si souvent à l'origine de troubles digestifs graves, en particulier les rhinopharyngites et leurs complications, les plus fréquentes, l'otite et la mastoidite.

L'influenza, la rougeole, la coqueluche et les rhino-pharyngites grippales sont pour les enfants hospitalisés, des maladies extrêmement meurtrières, et qui l'an dernier, en 1928, ont été cause de plus de 69 pour cent des décès à la Crèche d'Youville. C'est ce qui m'a amené à dire au début de ce travail que tous nos efforts doivent maintenant être dirigés vers ces trois ou quatre maladies graves dont la terminaison la plus fréquente est la broncho-pneumonie.

L'INFLUENZA EPIDEMIQUE

L'influenza est certainement une des maladies les plus graves et les plus meurtrières que nous ayons à combattre. Heureusement, elle ne survient que périodiquement, à des intervalles d'une dizaine d'années, et d'autre part, les nouveau-nés semblent jouir vis-à-vis d'elle d'une immunité naturelle qui les met à l'abri de cette infection et de ces complications pulmonaires au moins jusqu'à l'âge de trois mois. Mais, par contre, pendant la dernière épidémie qui a duré chez nous de novembre 1928 à la fin de janvier 1929, on peut dire que pas un enfant âgé de plus de quatre mois n'y a échappé, et, ce qu'est peut-être pire, à un certain moment, près du tiers de notre personnel hospitalier, religieuses, infirmières et aides, souffraient de la grippe, durant le temps, précisément, où nos enfants exigeaient des soins plus assidus et plus minutieux.

En dehors de sa gravité, et à part le fait que les enfants de moins de trois mois semblent jouir d'une immunité naturelle vis à vis de l'influenza épidémique nous n'avons pu arriver, durant la dernière épidémie, à aucune conclusion pratique qui puisse servir à combattre ou à prévenir cette infection et ses nombreuses complications pulmonaires, pneumonie, broncho-pneumonié, et pleurésie purulente.

ROUGEOLE

La rougeole est, peut-être, à part l'influenza épidémique, la maladie la plus grave dont puissent être atteints les enfants hospitalisés.

Les épidémies de rougeole ne surviennent qu'à tous les trois ou quatre ans. Les nouveaux-nés jouissent vis-à-vis d'elle d'une immunité naturelle qui disparaît, comme pour l'influenza, vers le troisième ou quatrième mois. Mais après cet âge, pas un enfant n'y échappe, et on dirait que plus l'enfant vieillit plus les complications sont fréquentes et graves. Les complications pulmonaires sont les plus fréquentes de beaucoup, mais on rencontre également un très grand nombre d'otites aiguës compliquées ou non de mastoidites, qu'il faut absolument rechercher et traiter.

La rougeole est apportée dans les crèches par des membres du personnel; les infirmières, ou les aides, reviennent en état d'incubation de leur famille ou d'une visite chez des parents ou des amis. Après quatre, cinq, ou dix jours on constate qu'elles sont atteintes de rougeole, mais durant ces quelques jours, elles ont semé inconsciemment la maladie dans les salles. Elle peut également être apportée par des enfants qui nous sont envoyés en pleine période d'incubation de rougeole.

Les constatations pratiques que nous avons faites à la Crèche d'Youville sont les suivantes: La rougeole est une maladie excessivement grave. Ses complications les plus fréquentes sont la bronchopneumonie et la pleurésie purulente. A part le sérum de convalescents qu'il est impossible de se procurer en temps opportun et en quantité suffisante, aucun traitement spécifique. Une fois entrée dans une crèche, il est impossible, par les moyens connus, d'empêcher la rougeole de se répandre. Mais la très grande contagiosité de cette maladie fait qu'au bout de deux mois l'épidémie s'éteint d'elle-même. Les seuls moyens prophylactiques que nous ayons à suggérer seraient de surveiller étroitement les foyers familiaux de contagion, et de refuser l'admission à tout enfant dont le lieu de provenance est douteux.

LA COQUELUCHE

La coqueluche est beaucoup moins contagieuse que les précédentes. Mais comme elle se communique surtout dans les quelques jours qui précèdent les quintes, et qu'il est à peu près im-

possible au début de différencier une toux de coqueluche d'une toux de trachéite ordinaire, il arrive la plupart du temps que l'on isole dans les pavillons spéciaux des "coqueluches" qui n'en sont pas, et qu'on garde dans les salles des "rhumes" ordinaires qui deviennent, au bout de quelques jours, des cas de coqueluche franche.

Il nous manque un moyen sûr de faire un diagnostic positif de coqueluche avant l'apparition des quintes. C'est, d'après moi, la seule raison pour laquelle nous n'avons pas encore été capables de nous débarrasser de cette maladie. En attendant ce moyen, il faudrait que les crèches fussent assez spacieuses pour qu'on puisse y organiser des salles spéciales où les "douteux" seraient isolés les uns des autres dans des box. Comme pour la rougeole et l'influenza épidémique, il semble exister une certaine immunité naturelle qui disparaît vers le troisième mois.

Aucun traitement spécifique curatif ou prophylactique nous a donné des résultats constants sur lesquels on puisse baser des conclusions pratiques.

RHINO-PHARYNGITE GRIPPALE

Les rhino-pharyngites grippales peuvent être causées par un nombre considérable de germes infectieux. Comme nous l'avons déjà vu, jusqu'à l'automne 1927, la plupart des cas de rhino-pharyngites que nous avions n'étaient en somme que des cas de diphtérie nasale. L'immunisation contre le bacille de Klebs-Loeffler a mis nos enfants à l'abri d'une cause importante d'infection rhino-pharyngée, mais depuis, deux fois par année, le printemps et l'automne, nous avons encore à faire face à des épidémies plus ou moins graves de "grippe canadienne". Tout le monde en souffre, même le personnel. Mais ces épidémies sont d'autant plus meurtrières que les enfants en bas âge semblent plus particulièrement susceptibles aux complications pulmonaires dont elles sont, dans les cas graves, la terminaison fatale.

Leur apparition coïncide tellement bien, et de façon tellement constante, avec la période de l'année où il est impossible de chauffer convenablement les pièces de la maison, que je suis porté à croire que la température ambiante a une influence marquée sur l'état de résistance de l'organisme de l'enfant vis-à-vis de cette infection. En effet, au printemps et à l'automne,

personnel médical d'une crèche doit comprendre un nombre suffisant de médecins spécialisés, tout comme un hôpital général d'enfants ou d'adultes, et organisé selon les grandes lignes indiquées par le Dr. Abt, de Chicago.¹⁰ Chaque service doit jouir d'une certaine autonomie, mais, par contre, il ne faut pas que les différents services médicaux soient isolés les uns des autres par des cloisons trop étanches. Au contraire, le succès dépend en grande partie d'une collaboration étroite, intime et amicale, entre les divers médecins de l'institution. Ces services médicaux, pour être cimentés, pour ainsi dire, les uns avec les autres, doivent être unis sous la direction centralisée d'un chef médical. Il faut de toute nécessité qu'il y ait, dans une institution comme la Crèche d'Youville, une personne autorisée qui soit au courant de tout ce qui se passe ou de tout ce qui se fait dans quelque partie que ce soit de l'institution. Le succès dépend également d'une co-opération étroite non seulement entre les divers médecins mais entre les médecins et le personnel hospitalier.

Le personnel hospitalier doit être assez nombreux. Chaque infirmière ne doit avoir sous ses soins plus de sept ou huit enfants. Chacune d'entre elles doit être instruite, mais l'instruction n'est peut-être pas aussi importante que ne le sont dévouement et la bonne volonté.

Le personnel hospitalier d'une crèche doit comprendre, dans ses cadres, un ou plusieurs internes. Il est regrettable que malgré nos efforts nous n'ayons pas encore un aide si indispensable. Je suis convaincu que nous aurions pu, grâce à lui, arriver à des résultats encore plus marqués que ceux que nous avons obtenus.

CONCLUSIONS

1.^o Le problème des crèches est soluble. Les statistiques étrangères, comme celle de la Crèche d'Youville, le démontrent.

2.^o Le problème des crèches est un problème infectieux.

3.^o Les enfants hospitalisés dans une institution ne meurent pas d'une maladie qui soit propre à cette institution. Et le milieu hospitalier ne diffère du milieu familial que parce qu'il constitue une conglomération où les individus y sont plus fréquemment exposés aux maladies contagieuses.

4.^o Enfin, maintenant que nous comprenons mieux le problème alimentaire infantile, les statistiques des crèches dépendent des mesures qui seront prises pour prévenir tout un groupe de maladies, toutes évitables par définition.

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VACCINATION AND ENCEPHALITIS.—An encephalitis, indistinguishable from that which occasionally follows recent vaccination ("post-vaccinal encephalitis"), quite commonly occurs idiopathically—that is, without being preceded by any known infectious disease: such an encephalitis also occurs after influenza and whooping-cough, again in subjects who have never been vaccinated or not vaccinated recently. In the *Lancet*, 1928, i, 1250, and 1929, i, 221, Russel Brain and Donald Hunter reported on six cases of encephalomyelitis in children, three of whom were vaccinated in infancy and two had never been vaccinated. (No

reference to vaccination is made as regards the sixth child.) They distinguish this condition from encephalitis lethargica, but stress its marked clinical similarity with the encephalitis following vaccination. It is plain, therefore, that cases of encephalitis of the post-vaccinal type may occur in unvaccinated persons.

"Now the great secret of wisdom undoubtedly consists in knowing what we ourselves are, what we can, and what we ought to do; as that of prudence is to know what others are, what they can do, and to what they are inclined."—J. C. Lavater.

THE ADVANTAGES OF PRELIMINARY EXAMINATION AND PREPARATION OF THE SURGICAL PATIENT*

By F. W. LEECH, M.B.,

Toronto

I THINK all agree that there accrue to the patient, surgeon, and anaesthetist many advantages through the thorough examination of that patient preparatory to his receiving an anaesthetic, be it general, regional, spinal, or colonic. Perhaps in certain instances the surgeon may content himself with the thought that a reputable internist has examined the subject for anaesthesia. This is ideal, but does not preclude the examination by the anaesthetist, as he evaluates the risk from a different standpoint.

Owing to the psychic element in the production of shock our first contact with the patient is of great importance. We learn of his fears and endeavour to assuage them. Not infrequently we learn of his reaction to certain forms of anaesthetics he has had previously, and his desires in this respect. Should these not meet with our approval we can probably explain the rationale of some other anaesthetic agent.

While we have been observing the patient, we note if he is over or under weight, frail or robust, pale (anaemic), toxic or feverish, if he flushes easily (unstable vaso-motor control). Are the veins prominent? Are the eyes puffy, or is there other evidence of oedema? Does the thyroid appear enlarged? Are there tremors of the fingers, or clubbing? etc.

A brief history of familial tendencies and previous illness should be obtained, especially noting the occurrence of epilepsy, insanity and asthma in the family, and, in the individual, anaemia, cardio-renal disease, hypertension or hypotension, diabetes, destructive disease of the liver or its appendages, including toxæmias of pregnancy and other prolonged toxic conditions, bacterial or autonomic. One should inquire as to the habits, particularly as regards the use of alcohol and cigarettes.

And now proceeding to the physical examination of the patient, we note the size and outline of the pupil and its reaction to light; the condi-

tion of the teeth and naso-pharynx, as infection there may readily be carried into the respiratory passage. One should palpate the thyroid gland in all cases. The general characteristics of the pulse are recorded, noting especially its volume and if it is well maintained.

The chest examination should stress the patency of the airway, the character of the breathing, the free excursion of the whole chest and especially the diaphragm, evidence of tuberculosis or other chronic infection, the presence or absence of moist râles at the bases of the lungs. In the examination of the heart one should observe particularly the quality of the heart muscle sounds as well as its other features.

A special effort should be made to obtain a record of the normal blood pressure while the patient is in a tranquil state, recording the systolic and diastolic readings so that the pulse tension may be deduced. Our interpretation of the various phases of blood pressure varies, but I agree with Denman that the pulse pressure is of greatest importance in determining the condition present, whether due to heart or arteries, and is most important in determining our treatment. Lauder Brunton says in substance: Pulse pressure depends upon pulse rate. If the pulse is slowed more time is allowed for the blood to flow through the arterial system during diastole. Diastolic pressure will be lowered and pulse pressure increased. The reverse also applies. A weak heart will not raise arterial tension as rapidly as a stronger one, and the time elapsing between the end of each systole and the next will be shorter and the pulse pressure lower. In a strong heart the interval between systoles is longer and there is a greater pulse pressure. When the blood vessels are contracted the diastolic blood pressure remains high and the pulse pressure is relatively low, and vice versa. A low systolic pressure with a large pulse pressure shows dilated vessels and probably a strong heart. A low systolic with a small pulse pressure signifies a weak heart; in addition there is

* Read before the Section of Anaesthesia, Academy of Medicine, Toronto, February 28, 1929.

probably some dilatation of the vessels, though a feeble heart with normal vessels could give this picture.

Of the laboratory investigations the commonest one of course is the examination of a single specimen of urine voided a few hours before operation. Should we be satisfied with this? Should we not at least have a report upon a 24-hour specimen, or, better still, a report upon several specimens obtained at intervals? The presence or absence of albumin or casts, sugar or acetone, in a single specimen is of little value. In cardiovascular or other doubtful cases the phenosulphophthalein and water excretion test of kidney function and a blood urea estimation are of value, especially if one of the direct anæsthetic agents is to be administered.

Of equal importance is the estimation of the percentage of hæmoglobin and the number of red blood cells. During anæsthesia there is a definite suboxidation or anoxæmia in direct proportion to the degree of anæsthesia. If gaseous agents are used the oxygen molecules in the oxygen-carrying elements of the blood and in the tissues are supplanted. If one of the direct agents is used the same is true to a lesser degree, but in addition the protoplasm of the cells is rendered inert, thus lowering its own metabolism. Hence, if the percentage of hæmoglobin is low and the red blood cells are reduced in number, the margin of safe anæsthesia is proportionately reduced. A drop of 15 to 25 per cent in the oxygen-carrying power of a robust patient is of slight importance, but in anæmic individuals, who are already carrying a maximal load, is serious and may mean decompensation. The direct anæsthetic agents are destructive to the red blood cells and platelets and retard the activity of the blood-forming organs. Hence the metabolism of the already anæmic patient is further interfered with, and he may be seriously handicapped during convalescence. It is generally conceded that no patient with a hæmoglobin index below 60 per cent, and a red blood count below 3,500,000 per c.mm. should be given an anæsthetic in other than an emergency.

The effects of anæsthesia upon the liver must receive careful consideration. In all those cases where the history or clinical symptoms leave room for doubt, a study of bile pigment disturbances and hepatic function should be undertaken. Thalheimer, Lee, and others have em-

phasized the balance of function between liver and pancreas during anæsthesia. There is a rise in blood sugar and a drop in insulin units (Minnett). As a result of the interference with the glycogenic function of the liver and the curtailment of available carbohydrate, the fat combustion is incomplete and acid bodies (oxybutyric and diacetic) along with their allied substance, acetone, appear. Anderson would entirely explain the condition of shock by this interference with the glycogenic function of the liver. Crile, too, considers shock as an "intracellular acidosis". Other means of estimating the patient's condition are worth mention.

First: the breath-holding test. Ask the patient to take three deep breaths and hold the last one. If he can hold it easily for 40 seconds he is considered a good risk. If he can hold it for only 20 seconds we suspect cardiac disease, with a relative or actual acidosis.

Second: Moot's rule, which takes into account the balance between the heart and the work it has to accomplish (Wilson). It is $\frac{\text{Diastolic Pressure}}{\text{Pulse Pressure}} \times 100$. If the resultant figure lies between 30 and 70 he is considered a good risk; if below 25 or over 75 he is a poor operative risk.

Third: a more or less similar means of estimating the stability of the heart is the "energy index". It is: systolic pressure + diastolic pressure \times pulse rate. If the resultant figure (considering only the thousands) lies between 12 and 18, the patient is considered a safe operative risk.

Only through institution of suitable corrective measures will the information elicited during this investigation be of value in rendering our patient a safer anæsthetic and surgical risk. These we will consider briefly under the various headings in the preparation of our patient.

The environment of one sent into hospital for operation should receive consideration. The room should be quiet and suitably lighted. It should be decorated in soft harmonizing colour schemes. We have not infrequently seen patients develop severe headaches and become almost hysterical in a room tinted in yellow or orange shades. The patient should be surrounded by cheerful, competent nurses who inspire confidence within him. When possible he should have two or three days' complete rest under such conditions,

in order that the physical examinations and laboratory investigations may be completed.

The diet should be light and nourishing and should include large quantities of fluids, fruit juices, and carbohydrates in order to increase the glycogen reserve in the liver. This applies particularly to children and to adults who are undernourished or dehydrated, or both. The fluids may be continued right up to within three or four hours of the operation. The bowels should be kept active without purging. Purging depletes the body fluids and withdraws the stores of glycogen. Sleep at night should be provided when necessary by the use of the milder sedatives. The patient who is awake all night, and in a state of absolute terror, is too often the patient who succumbs to "nerve exhaustion" during the early stages of anaesthesia.

Those cases who have insufficient cardiac reserve and cardiorenal cases will benefit by a prolonged rest with suitable dietary and medical measures. The purely renal cases, too, must receive careful dietary and eliminative preparation. The anæmic patient, whether of primary or secondary type, and those who show hæmolytic, should receive one or more transfusions of about 500 c.c. of blood at intervals of three to five days if time permits. In cases of emergency the transfusion should be carried on during the operation. No other fluid is retained in the circulation to the same extent as is whole blood in cases of shock from injury.

Those cases where there is a history, or clinical evidence, of impairment of liver function, obstruction or jaundice, also cases of ketosis, except perhaps diabetics, will, in the opinion of Anderson and Lee, be materially benefited by giving one to two litres of a 10 per cent glucose solution intravenously with 10 to 20 units of insulin per litre of glucose solution either in the solution or in divided doses intramuscularly. It has been shown by Dale and Best that the insulin not only increases the combustion of carbohydrates but also promotes the storing of glycogen in the liver. This is perhaps the most important factor in avoiding a post-operative acidosis or ketosis. I have purposely avoided touching upon the preparation of the diabetic, as this is perhaps better left in the hands of the internist who has special knowledge of such cases.

Our final preparation of the patient before

entering the operating-room consists in administering suitable pre-medication. Gwathmey considers that proper preliminary medication is of equal importance with the general anaesthetic agent. Continuing, he said of his experiments upon 500 animals: "Regardless of the anaesthetic used, whether ether, nitrous oxide and oxygen, or one of the hydrocarbon gases, if preliminary medication was not administered pathologic lesions in the lungs were invariably found at necropsy." Most of us consider that proper preliminary medication protects the patient. It reduces the metabolic rate and reduces the amount of general anaesthetic required, and increases the margin of safe anaesthesia. The induction is less difficult and is free from the usual struggles of the excitement stage.

Many nose and throat surgeons feel that pre-medication is contra-indicated in their work. This is a debatable point, but I personally believe that the dangers of foreign material reaching the lungs are not greater after moderate pre-medication. The patient may still be kept in a stage of light anaesthesia so that the cough reflex may be readily elicited. The respiratory efforts are relatively shallow, quiet and rhythmic, with less opportunity for the inspiration of foreign material.

The drug in most common use is morphia. Gwathmey prefers to combine with it the synergistic action of magnesium sulphate. He gives morphia gr. $\frac{1}{8}$ in 2 c.c. of 50 per cent magnesium sulphate intramuscularly every 15 minutes until three doses are administered to robust males, and two doses to females. He finds that the action of morphia is prolonged to four times that of morphia alone. He gives also chloretone, gr. 10, by mouth or as a suppository. If unconsciousness is desired before going to the operating-room he gives a retention enema containing paraldehyde, drm. 2; ether, oz. $2\frac{1}{2}$; oil q.s. ad oz. 4.

Rowbotham divides his patients into four groups:

First: children under seven years, the sick and puny over that age, very old and feeble adults, those with low blood pressure, toxic and shocked patients, those who have suffered from long standing pyrexia, and those anæmic from hæmorrhage. To these he gives per rectum paraldehyde, drm. 1 per stone of body weight,

the use of which considerably improved the prognosis of syphilis. We wish to point out here the excellent results obtained by malaria-therapy in the treatment of nervous syphilis, and especially of general paresis. The evolution of this syphilitic meningo-encephalitis, considered as unrelenting until these last few years, is now checked in about 40 per cent of the cases. Malaria-therapy should also be applied in cases that are Wassermann-fast, in order to prevent them from reaching the nervous stage of syphilis. The value of Von Jaupegg's method is priceless. We would suggest its more frequent use in our clinics of syphilology.

The syphilologist, as the dermatologist, must be a clinician and a general pathologist, he must have a knowledge of laboratory findings, and must strive to become an accomplished therapist. Examining a patient with a cutaneous rash, he will not content himself with a blood test and wait for the laboratory report before making a decision. He must be familiar with all the subtleties of clinical diagnosis, and be able to distinguish an eczema from a macular syphilide, a tuberculous gumma from a luetic tubercle. He must, of course, be able also to interpret the findings of the various laboratories, anatomic-pathological, serological, bacteriological, radiological, so valuable in syphilology. He must be a general pathologist and be able to diagnose a visceral lesion caused by treponema, to recognize an aortic insufficiency, the onset of an aneurism, the very first symptoms of an affected central nervous system, an endocrine disorder, etc. Before undertaking the treatment he has to thoroughly examine all the organs of the patient and should make sure of their proper functioning. He must take into consideration the individual characteristics inherent in each patient, which can react on the principal disease. In a word, to treat syphilis perfectly one must first be a real internist. He is the one who can give the most appropriate treat-

ment and who can cure the greatest number of syphilitics.

CONCLUSIONS

1. Dermatology and syphilology are absolutely bound together. They form one specialty: Dermato-syphilology.

2. Urology and syphilology are two totally different specialties. Their bounds have been united long enough. The sooner they are divorced from each other, the better it will be for the specialist and the patient.

3. Dermato-syphilology should not be relegated to the second place, under the ascendancy of medicine or surgery. It should be regarded and dealt with as one of the most important specialties of medicine, as is understood in nearly all European universities.

4. The teaching of dermato-syphilology must be organized in such a way that the essential knowledge of how to treat the most common dermatoses and especially to recognize at their onset tuberculosis, syphilis, cancer of the skin, be given to medical students, who must undergo a compulsory course of study in this specialty, and also to practitioners, by means of post-graduate courses.

5. The ideal organization of a clinic of dermatology and syphilology in a University hospital is undoubtedly the one which forms a complete unit, having entire autonomy, with anatomic-pathological, serological, mycological, bacteriological, bio-chemical and physiotherapeutical laboratories attached, and also possessing a staff able to recognize and treat all cases of syphilis and skin diseases.

In closing, may we be allowed to express the hope that all universities of the Dominion will follow the example set by the University of Montreal and the Nôtre Dame Hospital, who have already realized this ideal, and will share in training practitioners who will become a wonderful help in the campaign undertaken in all countries to combat cancer, syphilis, tuberculosis, three scourges which threaten the individual, the family and the race.

G. Petenyi describes the appearance in measles, one or two days before the eruption on the Koplik spots, of small petechial hæmorrhages on the buccal mucosa. In number, there were 3 to 8 on the buccal portion; a

greater number on the gums, up to 20. They remained two or three days. In 14 cases of measles, observed during the early period of incubation, these hæmorrhages were found in six.—*Orv. Hetil.* 73: 1929.

Case Reports

A CASE OF CONGENITAL HYPERTROPHIC PYLORIC STENOSIS IN A MAN AGED SEVENTY-TWO*

By F. D. ACKMAN, M.D.,

Montreal

Cases of hypertrophic pyloric stenosis of congenital origin in adults have been described in the current literature from time to time, and indeed this condition is referred to in most of the standard text-books. Unfortunately, disagreement regarding the congenital nature of the lesion has lead to confusion with other forms of pyloric obstruction. While some writers, including such an eminent pædiatrician as Richter,¹ have accepted the congenital view, other authorities have found it difficult to do so.

Among the earlier descriptions of the condition, that of Maier² in 1885 is probably the best. This writer properly distinguished the lesion from other pyloric obstructive conditions. His conclusions were based on autopsies on 31 cases that came under his personal observation, and the records of these appear in his article. The ages varied from 12 to 80 years, but most of them were well advanced in adult life. There were 26 males and 5 females, a ratio notably corresponding closely to that in infants. The history in all cases showed a marked similarity. Practically all had, from early infancy or childhood, suffered from attacks of epigastric pain accompanied by vomiting. Frequently there was distension, epigastric discomfort, and eructations of gas after meals. The characteristic pathological findings were: a greatly dilated stomach with a funnel-shaped narrowing of the antrum leading into a constricted zone, 2 to 8 cm. in length, corresponding to the pyloric canal. To this shape of the stomach, antrum and pyloric canal, Maier applied the term "*trichterförmig*" (funnel-shaped). The pyloric sphincter was always hypertrophied and very firm, with a marked narrowing of the orifice. In some cases

the diameter of this opening was not more than 2 to 3 mm. In the younger cases the gastric musculature showed hypertrophy throughout. In the more elderly, however, while this hypertrophy persisted in the antrum and pyloric canal, the muscularis of the body of the stomach always showed marked atrophy. The mucosa in the pyloric canal was frequently thrown into folds which added to the obstruction. Microscopic examination consistently showed hypertrophy and hyperplasia of the muscularis of the antrum and pyloric canal to be principally confined to the circular fibres. In only a few of the cases was there an increase in fibrous connective-tissue. In none of the cases was there any evidence of a previous ulcerative or inflammatory lesion.

Bassler,³ in 1920, described two cases found at autopsy, one in each sex. In both of these he traced the symptoms to infancy. This writer stressed the point that the diagnosis is rarely made clinically, not so much on account of its great difficulty as because the condition is rarely thought of.

Two cases have also been described by Maylard.^{4,5} The last one, in 1920, was diagnosed as malignant at operation and a resection was carried out. The patient unfortunately died of intercurrent pneumonia, and Maylard naturally expressed regret that he had not performed a simple gastroenterostomy. In this connection it should be pointed out that pneumonia following gastroenterostomy for the relief of chronic cicatricial pyloric stenosis is the commonest cause of death. In this case the lesion, and not the type of operation, was probably the predisposing factor.

Further, cases have been described by Landerer,⁶ Russel,⁷ and others. All writers are in agreement regarding the etiology and pathology of the lesion, and all feel that it is not so uncommon as may be supposed.

A case has come to the attention of the Pathological Department of the Montreal General Hospital, through the courtesy of Dr. H. R. Clouston of Huntingdon, P.Q., in whose practice it occurred.

* From the Pathological Laboratory, The Montreal General Hospital, Montreal.

Read before the Canadian Medical Association, at Montreal, June, 1929.

CASE REPORT

The patient, R.G., was a retired farmer, aged 74. His earliest history—which is so important—was not easily obtained on account of his age, and was not very clear. Such as was obtained was learned chiefly from his relatives. These all stated that he was a notoriously difficult baby to raise and always appeared undernourished. As a young boy he suffered frequently from attacks of "stomach trouble", many of which were severe enough to require immediate medical attention. No further information about his infancy and early childhood was obtainable. The patient himself stated that, as he grew older, he continued to remain underweight, and to suffer from attacks of colicky pain in the epigastrium, which were partly controlled by diet. From the age of thirty-five onwards these attacks became gradually more frequent, almost periodical, and were often associated with vomiting of an explosive type. Sometimes, when particularly careful about his diet, however, he had free intervals of as long as one year. At fifty-four years of age he was sent to Saranac, suffering from pulmonary tuberculosis. After six months there he was discharged, as an arrested case. He continued however to have a certain amount of cough and expectoration at times, during the remainder of his life.

When he was fifty-nine there occurred a noticeable increase in frequency and severity of his epigastric pain, and vomiting also occurred more often. When sixty-four, he had an unusually severe attack while en route to California, and had to be taken from the train to a hospital in El Paso, Texas. From this time onwards the symptoms steadily became worse, in spite of treatment. The attacks of pain came on mostly at night. Sometimes they began with general abdominal colic, but pain always finally localized in the epigastrium, and was associated with a sensation of fullness. Because vomiting always relieved the pain, he frequently induced it. When it came on while in bed he was sometimes relieved by sitting up. Anorexia, constipation, and emaciation all became marked. The patient stated emphatically that, beyond the occasional use of morphine for pains, no medication ever helped him.

Physical examination at the time of his last illness revealed an elderly male who was very weak, pale, and emaciated. The abdomen showed no abnormal rigidity, no points of tenderness, and no palpable masses. Percussion, however, revealed a very much dilated stomach. Urinalysis showed albumin and casts. A bedside barium series was attempted. The first plate showed a large propped stomach. The lowest point of the lesser curvature was below the level of the anterior superior spines. There was a pre-pyloric bulging in the greater curvature. Unfortunately, the meal was vomited before further plates could be taken. It was soon apparent that, besides a reactivation of his pulmonary trouble, the patient had a pyloric obstruction which was increasing in severity and already endangering his life. About this time the patient was seen by Dr. W. F. Hamilton, of Montreal, who corroborated Dr. Clouston's findings. All forms of diet failed to prevent the vomiting, and this finally became so frequent that he died of inanition on June 27, 1928.

Autopsy findings.—The stomach was extremely large, ballooned out with gas, and contained a large amount of fluid. There were no perigastric or peripyloric adhesions. Most of the antrum tapered in a funnel-like fashion to a narrow zone at the pylorus, 2 to 3 cm. in length. The pyloric ring itself was very firm and constricted. The orifice would only admit the tip of a lead pencil, and, when an attempt was made to test its patency with water, only a thin stream could be forced through. It measured less than 3 mm. in diameter. On opening this and the stomach, the sphincter pylori was found to be a hard, resilient, pale, cord-like structure 0.5 cm. in diameter. So firm was this that it felt almost cartilaginous. It was not unduly adherent to the adjoining tissues and the mucosa over it showed

no scarring nor evidence of ulceration. The wall of the antrum showed a greatly thickened musculature, while the mucosa here was also intact. Towards the pylorus it was thrown into folds which added to the obstruction. There was a prepyloric diverticulum in the greater curvature 3 cm. in diameter and of the same depth. The wall of the remainder of the stomach was greatly thinned out and inelastic, while here the mucosa was atrophic. Nowhere in the mucosa of the stomach and duodenum was there any evidence of old or recent ulceration. See Fig. 1.

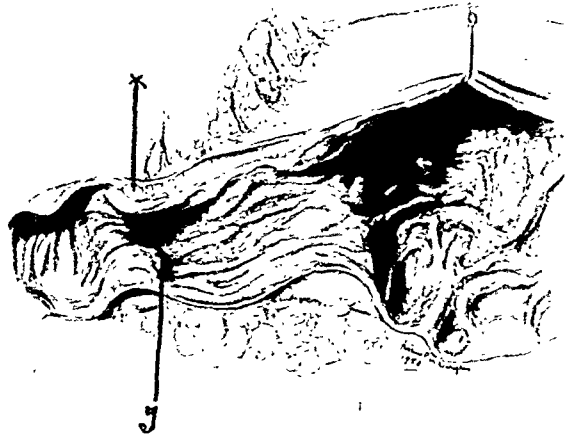


FIG. 1.—The pyloric portion of the stomach and first part of the duodenum laid open, showing the funnel-shaped antrum, narrowed pyloric ring, and the hypertrophied muscularis of the antrum and sphincter pylori. X—indicates the sphincter pylori. Y—marks the opening of the prepyloric diverticulum.

Sections for microscopical examination were stained with hæmatoxylin-eosin, phosphotungstic acid, Van Gieson's stain, and by Mallory's connective-tissue method. The hypertrophied sphincter was found to consist almost entirely of muscle fibres, with surprisingly little fibrous connective-tissue. The longitudinal fibres were not especially hypertrophied. The mucosa showed well formed glands extending fairly deeply. About the bases of these there were scattered areas of small round celled infiltration, but no especially increase in connective tissue. The lymph follicles were somewhat large, but the germinal centres were not unduly prominent. (See Fig. 2).

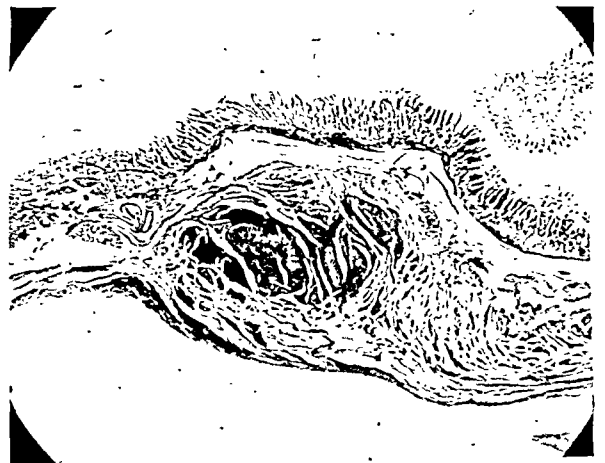


FIG. 2.—Planar microphotograph of longitudinal section through the wall of the pyloric canal, showing the greatly hypertrophied sphincter pylori and adjoining gastric muscularis. The mucosa is seen to be intact with some hypertrophy of the muscularis mucosae.

Section of the antrum showed hypertrophy and hyperplasia of the circular coat only. The mucosa here showed a slight amount of small round celled infiltration, but was otherwise intact. (See Fig. 3).

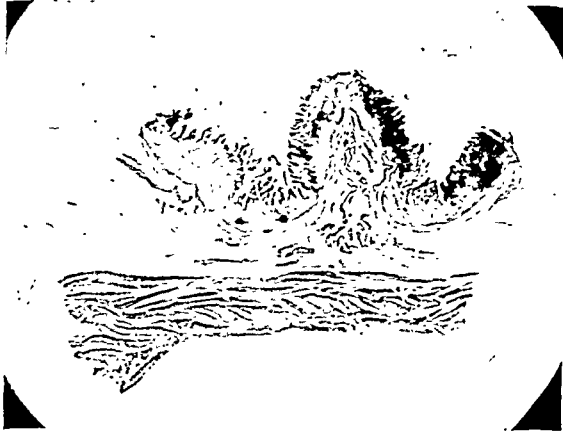


FIG. 3.—Planar microphotograph of section from the wall of the antrum for comparison with Fig. 2. The muscularis here also shows considerable hypertrophy. The mucous membrane is intact.

Sections from the dilated body wall showed all the coats thinned out and atrophic, with here also a slight small round celled infiltration in the mucosa. (See Fig. 4).

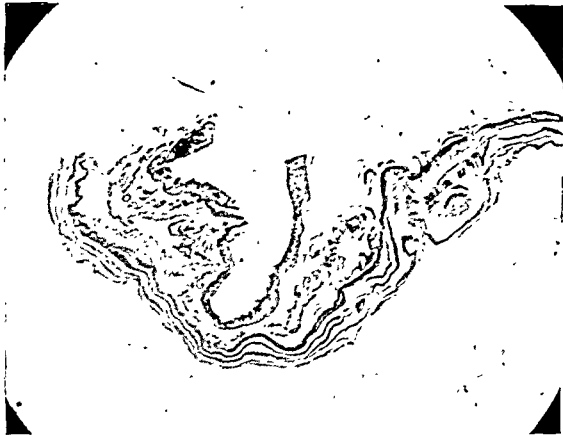


FIG. 4.—Planar microphotograph of section from the wall of the fundus for comparison with Figs. 2 and 3. All the coats show atrophy.

DISCUSSION

It is many years since Maier so ably brought this lesion to the attention of the profession, and yet very few cases have since been recorded. The excellent series of 31 cases presented in Maier's report makes it appear that there has either been a failure to recognize the condition, or more likely, as Bassler has suggested, that it is not looked for. According to these writers, it is not at all so uncommon as it would appear to be. Possibly it has been frequently confused, clinically, with other forms of pyloric obstruction, such as stenosing gastritis, or with other

conditions such as megalogastria. Careful inquiry into the childhood history should, in the majority of cases, give one a lead, while megalogastria shows no such long delay in the emptying of a barium meal as does this condition.

As has been before mentioned, the congenital origin of the lesion has been doubted by some writers, though on what grounds is not quite clear. In view of the comparatively frequent incidence of congenital pyloric stenosis in infants, it seems quite conceivable that some, at least, of the less marked cases should go on to adult life. The burden of proof that such is not the case would appear to rest upon the shoulders of those who doubt. Certainly, the pathological findings argue most conclusively for this etiology, and these, together with the history and clinical findings, leave small room for doubt.

TREATMENT

Ample evidence has accumulated to show the futility of prolonging medical treatment. Atropine and other anti-spasmodics are equally ineffective. Surgical measures are consequently indicated as in other forms of organic pyloric obstruction. The choice of procedure to be carried out will be determined by the individual case. When the condition is evident to the operator, some form of a pyloroplasty or a gastroenterostomy will probably be sufficient. That difficulty may be experienced, however, in ruling out ulcer or malignant changes is well illustrated in Maylard's last case. In such instances, of course, resection is an entirely justifiable procedure. It is doubtful if a simple Rammstedt procedure would suffice in any of these cases, particularly if there is marked atrophy of the gastric muscularis as in the more elderly.

SUMMARY

1. That congenital hypertrophic pyloric stenosis may go on to adult life before becoming a serious problem is well recognized.

2. Such a case, with typical lifelong history, clinical and pathological findings, is here reported.

3. This condition is probably more common than is generally thought.

4. The history and x-ray findings should go a long way towards ruling out other confusing conditions.

5. Surgical treatment is indicated, the nature of which will depend on the individual case.

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A CASE OF FIBROMYOMA OF THE FALLOPIAN TUBE WITH TUBERCULOSIS*

BY ELEANOR PERCIVAL, M.D.,

Montreal

Fibromyoma of the Fallopian tube is a very rare condition, only thirty-one cases having been reported, but the occurrence of tuberculosis in a tubal fibroid is even more uncommon.

The patient, a single white female, 39 years of age, was admitted to the Montreal General Hospital, on April 6, 1929, in the service of Dr. Montgomery, complaining of general malaise. For the past eighteen months, she had been growing progressively weaker; her work fatigued her greatly and the least exertion caused palpitation and dyspnoea. There had been some indigestion with belching of gas after food, but on the whole her appetite was fair. Night sweats had occurred occasionally, and there had been a loss of weight from 106 to 94 pounds in a year. The menses, although formerly regular and profuse, had for the past two years occurred every two weeks, with a scanty flow.

General examination revealed a very tired, pale, sallow young woman, whose temperature varied from 98° to 101°. Except for a slightly enlarged spleen, detailed examination of chest and abdomen, was negative. X-ray examination of the chest, the Von Pirquet test, and urinalysis were also negative. The blood count showed a rather marked secondary anaemia.

The pelvis was filled by a large firm non-sensitive tumour which lay across Douglas' cul-de-sac, while the uterus was small and mobile in front.

Although splenic anaemia had to be considered, a diagnosis of pelvic new growth, either tuberculous or malignant, was made, and operation advised. A supracervical hysterectomy was done, by splitting the uterus in the midline and removing each half of it along with its tubo-ovarian mass.

The patient made an uninterrupted recovery, the temperature falling to normal immediately after the operation.

In the drawing of the pelvic organs (Fig. 1), two markedly dilated, retort-shaped tubes are seen, one of which, on cut section, shows a solid tumour. The tumour, which was in no way connected with the ovary, had a lobulated surface, and was covered by the same lining membrane as the remainder of the tube. It was made up of two parts; the smaller section presented a white fibroid-like growth, with a tendency to



FIG. 1

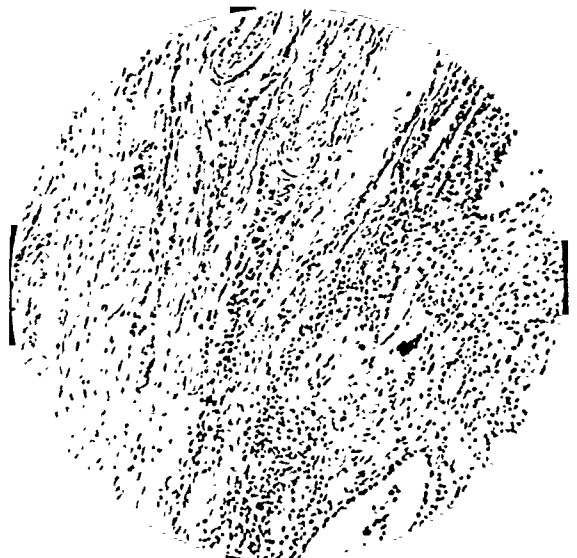


FIG. 2

* From the Gynaecological and Pathological Departments of the Montreal General Hospital.

whorl formation, while the remaining two-thirds composed of a yellow friable, and more necrotic, myxomatous tissue. The uterus was normal, grossly, and also the left ovary, while the right ovary had undergone cystic changes. The opening into the right tube from the uterus was patent, whereas that on the left side was closed.

right tube (see Fig. 4), a definite tubercle could be seen, while careful search elsewhere in the uterus showed no evidence of this lesion.

We are, therefore, dealing with a case of bilateral, tuberculous hydrosalpingitis, complicated by a large tubal fibromyoma extensively involved in tuberculous disease, and which had undergone, in part, caseous degeneration.

A CASE OF VOLVULUS OF THE STOMACH WITH CONGENITAL ANOMALIES OF DEVELOPMENT

By J. A. GORRELL, B.A., M.D.,

Winnipeg

I desire to present for record a case of volvulus of the stomach, occurring in a child.

N., 10 months old, male, was referred to me by Dr. J. A. McTavish on Feb. 26, 1928. The baby was breast-fed, and looked the picture of health. The bowels were regular. The child had suddenly taken ill with severe pain and cried out. After an hour he vomited. He used to turn over on his stomach and proceed to crawl ahead, which apparently seemed to relieve him. An enema was given and there was a slight movement, with a speck of blood. The temperature was normal; pulse, 120. A small amount of ether was administered and physical examination revealed a mass in the upper abdomen. He became very dehydrated. A diagnosis of intussusception was made and he was taken to the Children's Hospital, six hours after the onset of symptoms.

At operation an upper right rectus incision was made, and a very much dilated stomach was found, which appeared like a cyst, about the capacity of a quart. It was half filled with fluid and half filled with gas. A catheter was passed and the fluid and gas were drawn off. The stomach then collapsed. On lifting it up it could be seen that it was rotated from right to left on a vertical axis passing through the cardiac orifice. The duodenum was wound one complete turn around the pyloric orifice, causing complete pyloric obstruction. The stomach was rotated from left to right and then both its orifices became normal. The patient lived fourteen hours after the operation and continued to vomit during that period.

Microscopically, one saw in sections of both tubes numerous giant cells and tubercle formation. The large mass (Figs. 2 and 3) was made up of interlacing long, narrow cells, scattered through which are the typical giant-cells. The larger and more necrotic-looking mass had undergone caseation, as a result of a more longstanding tuberculous infection. It is interesting to note that in the endometrium near the patent

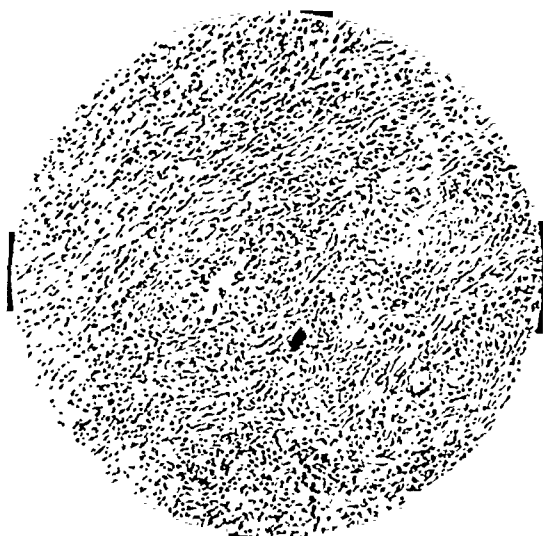


FIG. 3



FIG. 4

Microscopically, one saw in sections of both tubes numerous giant cells and tubercle formation. The large mass (Figs. 2 and 3) was made up of interlacing long, narrow cells, scattered through which are the typical giant-cells. The larger and more necrotic-looking mass had undergone caseation, as a result of a more longstanding tuberculous infection. It is interesting to note that in the endometrium near the patent

mistic than the majority. He considers tonsillectomy to be as safe during the stage of acute arthritis as later, and feels that it has the advantages at this period of reducing the risk to the heart and of definitely shortening the course of the disease. However, most workers feel that an operation during the acute stage is attended with more risk than later. They have noted that a number of patients have shown marked exacerbation of cardiac and arthritic symptoms following simple manipulation of the tonsils.

Small³⁹ is convinced that he obtains relief of rheumatic fever and of chorea by the use of his *streptococcus cardio-arthritis* serum. The dosage has to be carefully watched.

Bodenstab² treated 28 patients with pyramidon (antipyrin group) in doses of 2 to 3 grams daily. Favourable results were obtained in all instances, in fact five patients who had failed to respond to salicylates, experienced prompt relief when the change to pyramidon was instituted.

Dalichow⁹ employed intramuscular injections of aristosan (a mixture of formic acid with a thiocin derivative) in the treatment of sixteen patients. As a rule, improvement occurred after the second or third injection, even in persons who had been resistant to salicylate. No ill effects were noted.

In conclusion, one might say that, as regards treatment, certain drugs may show a slight advantage the one over the other, but the essential thing in acute rheumatic fever is prolonged bed rest following the first attack, measured not in weeks but in months. Associated with this there should be plenty of fresh air and sunshine and a well balanced diet.

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THE DOCTRINE OF SIGNATURES.—“Wall-nuts have the perfect Signature of the Head; The outer husk or green Covering, represent the Pericranium, or outward skin of the skull, whereon the hair groweth, and therefore Salt made of those husks or barks, are exceeding good for wounds in the head. The inner wooddy shell hath the Signature of the Skull, and the little yellow skin, or Peel, that covereth the Kernoll of the hard

Meninga and Pia-mater, which are the thin scarfes that envelope the brain. The Kernel hath the very figure of the brain, and resists poysons. For if the Kernel be bruised, and moystened with the quintessence of wine, and laid upon the Crown of the Head, it comforts the brain and head mightily.”—William Coles, in *The Garden of Eden*.

Clinical and Laboratory Notes

Tuberculosis: Simultaneous Demonstration of Tubercle Bacilli and Elastic Fibres

When there is plenty of sputum available about 4 c.c. of sputum is mixed with 10 c.c. of sodium hydroxide. With smaller amounts of sputum only 5 c.c. of normal hydroxide is used. This mixture of sputum and sodium hydroxide is heated over a water-bath for 20 minutes at a temperature not higher than 50°, stirring it lightly with a glass rod. It is then centrifuged. A smear of the sediment is allowed to dry, preferably in the incubator, and fixed in a flame. It is stained with carbol fuchsin, heated as usual, and washed; decolourized with 3 per cent alcoholic solution of hydrochloric acid, as usual, and washed; then stained one or two minutes with hæmatoxylin and cold saturated solution of lithium carbonate, each 1.0; absolute alcohol and distilled water each 20.0, and then washed. It is then decolourized with official iron-chloride solution for a few seconds and washed. With this method the tubercle bacilli are stained a beautiful red and greater numbers of them show than with the ordinary method. The elastic fibres are bluish-grey.—F. Jessen, *Beitr. für Klin. d. Tuberk* 65: No. 4.

The Shaw-Mackenzie Test for Cancer

An investigation was carried out at the instance of the Departmental Committee on Cancer, Ministry of Health and of the Medical Research Council. 200 sera were examined by a modification of the Shaw-Mackenzie test; briefly, a stock solution of dry saponified extract of carcinoma is prepared. The p^H of this must be carefully adjusted to 7.4. Fresh serum must be used, which is collected with a glass syringe, and which should be taken not sooner than four hours after a meal. The test is carried out by using equal quantities of serum and a dilution of the stock solution of extract, the serum being first placed in the tube and the extract layered on to the top of the serum. The tubes of extract and sera are then incubated at 37° C. for 18 hours, and should stand at room temperature for one hour before attempting to read the results. The reading of the results requires some qualification, but essentially, the presence of a white ring at the junction of the two fluids denotes a positive reaction. The work is described as a preliminary investigation and a summary of the results shows that of 71 cases of malignant growths 49 gave positive tests, 5 doubtful, and 17 were negative. Epitheliomata of the skin all gave negative results. Some cases treated with lead, x-rays or radium and some advanced inoperable cases also gave negatives. Of 102

cases of various diseases, other than growths, 65 gave negative tests, 10 doubtful, and 18 definitely positive. Venereal disease, heart cases, nephritis, pulmonary tuberculosis, pregnancy, and menstruation are liable to give "wrong" positives.—Watchorn, *J. Hygiene* 29: 71, 1929.

Cultivation of Tubercle Bacilli

Since guinea-pig inoculation is both costly and slow, H. J. Corper and N. Uyei have devised a special method for the identification of tubercle bacilli when these are present in small numbers in sputum, urine, or tissues. In order to destroy contaminating organisms the tuberculous material is incubated with an equal volume of 6 per cent sulphuric or 3 per cent hydrochloric acid, intimate contact being secured by centrifuging. They have obtained good results by subsequently planting the deposit on a medium comprising potato (autoclaved and subsequently ground), agar, glycerol, and crystal violet. A good growth of tubercle bacilli appears in from two to five weeks. The authors state that tests have proved this medium to be superior to that of Petroff, and as good as guinea-pig inoculation from the practical clinical standpoint. *J. Lab. & Clin. Med.*, p. 393, Feb. 1929.

A Simple Method of Obtaining Permanently Stained Preparations to Show Reticulocytes in the Blood

Joseph H. Wright in the *Glasgow Medical Journal*, p. 292, May, 1929, writes: "The ordinary methods of obtaining permanently stained preparations to show reticulocytes in the blood is unsatisfactory because of the unavoidable grouping and distortion of cells. The following modification has been used by the writer during the last six months:—

A drop of saturated aqueous solution of cresyl blue, about one-sixteenth of an inch in diameter, is put on the ear with the broad end of a needle. The skin is punctured through the drop, and when the mixture is about one-eighth of an inch in diameter films are made on cover-slips in the ordinary way. These are allowed to dry in air for three to four minutes, and are then stained with Leishman.

The advantages of this method are (1) its simplicity; (2) reticulocytes are well stained; (3) blood cells are evenly distributed and are not distorted; (4) basic staining is accentuated, so that white cells are more easily differentiated; (5) blood platelets show well; (6) the relative permanency; films eight months old show no signs of fading."

Editorial

THE PROBLEM OF MATERNAL MORTALITY

WE commend to the earnest attention of our readers, particularly those engaged in general practice, two important articles which are to be found in the current issue of our *Journal*. The first by Prof. J. R. Goodall, of McGill University is on Maternal Mortality, and the second, by Prof. Ross Mitchell, of the University of Manitoba, deals with the Late Toxæmias of Pregnancy, various conditions which have a direct bearing on the maternal death-rate. The *Journal* has referred to this topic on several occasions before, both editorially and otherwise. A noteworthy article, by Dr. A. D. Blackader, appeared in our June issue. We make no apology, however, for returning to the matter again, as it is engrossing a great deal of attention at the present time, and will probably continue to do so. There is, indeed, hardly any subject that is more worthy of our attention than the consideration of how best to lessen the toll of death in cases of childbirth.

Let us ponder over a few figures. The death rate among maternity patients in Canada was 5.6 per 1,000 (in the year 1928); in the United States it was 6.5. In Europe the proportion is less. In Great Britain, for example, it ranges between 4 and 6 in different localities. The best figures come from the Continent, where Holland, Denmark, Norway, Sweden, and Italy give their maternal death rate as between 2.3 and 2.8. Of course, it is not fair to draw comparisons from figures without qualification. Such statistics are not altogether comparable, for much depends on variable circumstances; figures may differ widely in a given country from time to time, and may differ widely at the same time in different parts of the same country. Nevertheless, all will agree that the maternal mortality rate, for Canada at least, is too high and can be improved.

Professor Goodall's article, which was written at our request, is constructive in character and provides much food for thought. He puts aside certain extraneous

circumstances, such as bad housing, poverty, illegitimacy, and the use of forceps, as not contributing materially to the death rate, but lays stress upon *infection*. Much as we may dislike to acknowledge it, it would appear that doctors and nurses are not without blame in this matter. They are frequently in contact with infectious material, and may, unthinkingly perhaps, carelessly sometimes, act as "carriers." Only on such an assumption does it seem possible to explain the remarkable difference in maternal mortality that is seen in two classes of obstetric patients—those attended by midwives and those confined in institutions—the mortality rate being as one to five in the two groups respectively. A very considerable proportion of maternal deaths is caused by the streptococcus, and Professor Goodall rightly stresses the need of attention to the nose and throat on the part of doctors and nurses, and the use of gloves and face masks. Here, no doubt, there will be found errors of commission and omission. Dr. Goodall goes farther and would separate the practice of obstetrics from that of surgery and gynaecology, and offers some very pertinent suggestions in regard to the practical training of medical students in midwifery. His is a counsel of perfection, perhaps, and some of his recommendations are more applicable to obstetric practice in cities and towns, but his remarks anent the distribution of infectious agents should give us all some heart-searching.

Professor Mitchell, also, has contributed a helpful article. The toxæmias bulk largely among the causes of death in childbirth. Both authors, we note, lay much stress upon preventive measures, that is to say, pre-natal care. While toxæmias of pregnancy may be mild, nevertheless they should not be neglected for that reason. Professor Mitchell points out that they are often recurrent and always serious; how serious is not always realized by the profession. Not only is pre-natal care a requisite, but after delivery mothers who have

suffered from toxæmia are under a serious handicap and should have trained care, not for days or weeks, but for months.

Not only must physicians and nurses be better trained, but they should be thoroughly alive to their responsibilities. Women also, need instruction, and this should be provided by the profession. Prospective mothers should be trained to ask for pre-natal care. The various problems, as they apply

to large communities at least, are not insoluble, but the difficulties are greater when we come to deal with the wide areas and sparse population of our Canadian West. Here, certainly, the problems are different from those of the East, and different also from those of Great Britain and other parts of Europe. We should gain greatly if we could publish the views of our western confrères.

A. G. N.

RECENT STUDIES IN CARBOHYDRATE METABOLISM

THERE is, perhaps, no subject that is receiving more attention from the investigator at the present time than carbohydrate metabolism. This is, doubtless, due to the stimulus afforded by the long-looked for discovery and isolation of insulin. The amount of literature that is published annually on the subject is so extraordinary, not to say, appalling, that the ordinary medical man who attempts to cope with it can only confess his utter inadequacy. He is in the position of a man who has been caught in a maelstrom and is striving with feeble strokes to make his way to shore. For this reason we welcome the lectures delivered recently by Prof. J. J. R. Macleod,¹ formerly of Toronto and now of Aberdeen, at the London Hospital, on *The Physiology of Glycogen, and the Role of Insulin and Epinephrine in Carbohydrate Metabolism*. In these lectures are to be found a consideration and critical analysis of work done recently on this subject, so important and so baffling, by an acknowledged master; one whose own researches, with those of his colleagues and associates, stand in the very forefront. We can, at last, see what point we have reached.

The discovery of insulin, which has been of enormous scientific and clinical value, has, unfortunately, not as yet led to the solution of all the problems involved. In the words of *The Lancet*, "Insulin has not proved to be a master key, but it has opened many doors and it has closed others by showing how slender is the evidence upon which certain orthodox ideas about carbo-

hydrate metabolism are based."² That insulin is a key in any sense is encouraging, and it is not an unfounded hope that it may yet prove to be a master key. It is clear gain, at least, that certain false conceptions have been done away with, so that a fresh start may be made.

When sugar is ingested its absorption from the alimentary tracts starts immediately. Furthermore, the accumulated evidence serves to show that the absorption takes place from the upper portion of the small intestine, and that the intestinal mucosa is endowed with a very highly specialized selective action, which is absent in the case of certain other absorbing membranes. When absorption has taken place and the sugar content of the blood is estimated very constant results are obtained. The alterations in the blood curve resulting from the administration of increased amounts of sugar, and those found in certain pathological conditions, are of considerable practical import, and their value is well known to every clinician. Numerous factors, however, enter in to influence the curve, such as the rate of absorption of the sugar from the intestine (which itself is governed by many factors), and the rate at which the tissues utilize the sugar that is absorbed.

The relationship of glycogen to the liver has also been under review. And in this connection it is well to note that the amount of glycogen to be found in the liver at any given time represents only the balance between processes of production and utilization, and is, therefore, not necessarily a measure of the rate at which these processes are proceeding during life. According to present indications glycogen is an essential

1. *The Lancet* 2: 1, July 6, 1929; 55, July 13; 107, July 20, 1929.

2. *The Lancet*, Editorial, p. 179, July 27, 1929.

intermediary in hepatic metabolism. The rather widely accepted view that glycogen is merely stored in the liver is not considered to be adequate by Professor Macleod. Pollak³ and, later, Markowitz,⁴ as a result of injecting epinephrine into animals, in whom the liver glycogen had been reduced to a minimum by fasting and strychnine, found that after each injection hyperglycæmia was induced, and after many injections considerable amounts of glycogen appeared in the liver. On the other hand, in the case of animals whose livers contain large stores of glycogen, the exhibition of epinephrine brings about a lessening of the store, as Olmstead and Coulthard have shown.⁵ We are, thus, confronted with the remarkable fact that the hormone epinephrine has a reversible action. It can cause glycogen to be deposited in the liver when none was there, and to be broken down when an abundance is already present. The same thing can be said about insulin, the other hormone that most definitely has an influence on carbohydrate metabolism. When insulin is given, without food, to fasting white rats it at first reduces the glycogen content of the liver, and, later, increases it, provided that a convulsive dose has not been given. Other observations of a somewhat different nature corroborate this conclusion. We are, thus, brought back to the original view of Claude Bernard that the glycogen of the liver is an internal secretion. He held, also, as is well known, that glycogen could be produced out of protein, while not denying that it could be formed also from absorbed carbohydrate.

With regard to the glycogen of the muscles it seems to be mainly dependent on the sugar of the blood, which may be derived either from the breaking down of the hepatic glycogen or more directly from absorbed glucose. It is possible, however, that some of it is manufactured in the muscles themselves out of protein and fat. As experimental results are conflicting, caution must be exercised in drawing conclusions. This much at least may be said, that while glycogen formation can occur in the muscles in

the presence of insulin, yet insulin is not essential for the process, for glycogen is formed in the muscles of depancreatized animals. Professor Macleod, on the basis of much experimental work, suggests that there is, in the muscles, some unknown precursor from which both glycogen and lactic acid are derived. This either breaks down first into glycogen, the lactic acid being formed at an independent rate out of the general store of glycogen; or it gives rise directly to both glycogen and lactic acid.

Coming now to the question of diabetes and the action of insulin it must be said that the answer to the riddle cannot yet be given. The low respiratory quotient, the lack of power to store glycogen in the liver, and the excessive formation of glycogen from other sources than protein, have been commonly interpreted to mean the failure of the diabetic to oxidize carbohydrate. This theory does not appear to have been seriously weakened. Professor Macleod sums up the action of insulin, so far as this can be deduced in the light of incomplete evidence, much as follows. Both in normal and diabetic animals there is no known stage in carbohydrate metabolism up to that in which lactic acid is formed from muscle glycogen in which insulin does not play a part. It inhibits gluconeogenesis and stimulates the formation of glycogen in the liver of diabetic animals; it retards the formation of glycogen in the liver of normal animals, except as a late effect when the animal is fasting. It lessens the muscle glycogen when given to fasting animals, but produces no such effect when carbohydrate is being absorbed, except when an excessive dose is given. Under all conditions, both in normal and diabetic animals, it stimulates the oxidation of carbohydrates, a process which is, however, much more marked in the diabetic animal. The net result is to lower the percentage of sugar in the blood, notwithstanding the fact that some of its effects, such as inhibited formation of glycogen in the liver, would tend to raise it. Professor Macleod concludes that the effects just mentioned are secondary to some other fundamental change. We must assume that insulin acts on some process that is dependent on the structural integrity of the cells; it stimulates this process, producing, on the

3. *Arch. f. exper. Path. u. Pharm.* 61: 149, 166, 1909.

4. *Am. J. Phys.* 74: 22, 1925.

5. *Am. J. Phys.* 84: 610, 1928.

one hand, a lowering of the glucose tension in the cell, so that sugar is removed from the blood, and, on the other, an accumulation of some intermediary substance, which, perhaps, in association with phosphate (since this is decreased in the blood as markedly

as sugar is after insulin), is then oxidized or polymerized to form glycogen. Here the matter rests for the present, but there can be little doubt that before long the remaining links will be forged in the chain of evidence.

A. G. N.

ON MONGOLISM

AN interesting contribution to the elucidation of the problem of Mongolian idiocy is contributed to the pages of the *American Journal of the Medical Sciences** by Dr. Madge Thurlow Macklin, of the University of Western Ontario. Since it was first differentiated as a clinical entity by Langdon Down in 1866 the etiology of this disease has been a problem of interest, and many and various have been the theories advanced for its occurrence. One of the most widely accepted explanations is that which attributes the defective condition to reproductive exhaustion on the part of the mother, associated with immaturity or senile degeneration on the part of the ovum. Among other hypotheses which have been advanced as possibly effective in the development of Mongolism are the following: syphilitic infection more or less distant; severe emotional strain on the part of the mother during the early period of pregnancy; an unusual difference between the ages of the parents; and endocrine disturbance in the mother or in the fetus itself. The fact that so many diverse theories have been advanced must be regarded as evidence not only of the complexity of the problem but also of the fact that a complete solution has not as yet been arrived at.

Dr. Madge Thurlow Macklin has undertaken a very exhaustive study of all the statistics and facts found in literature that could throw light on the problem, and with these before her has examined the several theories one by one and has come to the conclusion that not one of them affords a satisfactory explanation for the occurrence of the condition. Figures are presented to show that these defective children are born of mothers at all ages; in the majority of cases not later than the fourth pregnancy; that a Wassermann reaction is seldom found

either in parents or in the child; that during the World War hundreds of mothers were subjected to very severe emotional and physical strain, with no increase in the number of Mongolian imbeciles born; that the difference in age between the two parents in many cases is very slight, and that the mother may give birth not only to one Mongol but to two and three successively and may afterwards produce normal children. The suggestion that hyperthyroidism in the fetus may be the cause of Mongolism also fails; many cases have been reported of hyperthyroidism both in mother and fetus without any accompanying Mongolism, while on the contrary, on account of the close similarity between cretinism and Mongolian idiocy, many have attributed the latter to a deficiency of the thyroid. Nevertheless, the administration of the gland tissue has failed to bring about any improvement.

Dr. Macklin sums up briefly the results obtained from this research and states that the evidence is strongly against environmental influences, and much in favour of the defect being inherent in the germ cell and inherited.

Before entering upon a discussion of the mode of its inheritance Dr. Macklin calls attention to the fact that in a great many cases of Mongolian imbecility mention is made of the existence of the short little finger and of its incurved distal phalanx, and in some instances of the transverse line across the palm which divides it completely into two regions. These inherited defects, although they have no definite relation to Mongolism, point to the influence of heredity in such children.

If Mongolism is inherited the mode of its transmission demands careful investigation. Hermann* suggests that it is due to unit recessive factors. In considering this

* *Am. J. Med. Sc.* 178: 315, Sept. 1923.

* *Arch. Ped.* 42: 523, 1925.

possibility, we note that there are, so far as the writer is aware, only two records of a Mongolian idiot having given birth to children, but in both cases the children were normal, and in every instance of the birth of a Mongolian child the parents appeared normal, at least as far as idiocy of the Mongolian type was concerned. This fact, by Mendelian laws, at once rules out the possibility of the defect being a dominant factor.

Comparing Mongolism with amaurotic family idiocy, which occurs much less frequently than Mongolism, but also occurs in the offspring of normal parents, and hence may be regarded as due to a combination of two recessive factors, Dr. Macklin was able to collect records of 118 families in which this amaurotic idiocy occurred, and in which the order of the children was given. In addition to this there were 24 families reported in which the order of the children was not given. Of these 142 families there were 68 in which only one child in the family was defective, and 74 in which more than one were affected. These 142 families had a total of 279 defective children, or an average of 1.96, or nearly two amaurotic infants to the family. As compared with these Dr. Macklin found records of 2,491 families in which 2,526 Mongol children had been born. In 2,461 of these families only one child was affected; in 30 families there was more than one. Thus although in amaurotic idiocy nearly one family in every two had more than one child affected, in Mongolian idiocy only one family in 83 had more than one defective. Amaurotic family idiocy would thus appear to be due to factors which make the combination much more frequently than occurs in Mongolism, and, for reasons given above, may be considered as due to a combination of unit recessive factors. If Mongolism were due simply to one pair of unit recessive factors the probabilities of its affecting more than one child in a family would be similar to that of amaurotic idiocy. It may therefore be stated with some confidence that the inheritance of Mongolian idiocy is a much more complicated matter than dependence upon unit recessive factors or even upon two pairs of recessive factors would presuppose. Whether associated with several recessive factors, or whether there be one or more dominant factors, must

remain undetermined, as appropriate mating experiments cannot be made.

Dr. Macklin, however, has attempted by a study of the laws of chance, and by an original method of testing chances, to determine the percentage of defective offspring which would evolve out of various combinations of recessive factors, and has concluded after first testing three pairs of unit recessive factors, that five pairs afford possibilities in almost exact agreement with the conditions met with in Mongolism.

Such experiments and theoretical considerations, however, although not affording any definite proof of the mode of inheritance of Mongolism, do afford an explanation of how a condition dependent upon a number of factors can be so infrequent in most families that it appears only as isolated cases, while in other families it may affect as many as four out of ten children. In such an instance a parent would have almost the entire combination of factors present in his germ cells, but be saved from being a Mongol himself by the presence of one of the factors in the dominant condition.

In the summary at the end of the paper Dr. Macklin states that so far as the evidence collected will permit a conclusion to be drawn, none of the theories of environmental influences that have been advanced can be regarded as the cause of Mongolian idiocy. This she regards as due to inherited defects and therefore germinal in origin. The statement also that it is due to the presence of one pair of unit recessive factors cannot be supported. Its mode of inheritance would appear to be much more complex, and figures given show the similarity between theoretical results based upon the laws of chance and the actual statistics, if we regard the disease as due to the simultaneous presence in the germ cell of five pairs of recessive factors or two dominant and four pairs of recessive factors carried in as many chromosomes. Dr. Macklin does not suggest, however, that such agreement constitutes proof that this is the mode of inheritance of Mongolian idiocy.

A. D. B.

The word "factor" in this article is not synonymous with "gene", but signifies all those determiners which influence the appearance of this condition in the offspring, which can be found in one chromosome. Since in the author's opinion five chromosomes are involved, the disease is said to be dependent upon at least five factors.

A NEW TREATMENT FOR CHOREA

IN a recent issue of the *Lancet** Dr. Poynton and Dr. Schlesinger, both attending physicians of the Hospital for Sick Children in Great Ormond Street, London, describe a new treatment for chorea by the use of "Nirvanol," a new drug which recently has had a fairly extensive trial in Germany. In the clinics where this treatment has been used, it has met with such constant success that it continues to be employed in severe and obstinate cases. It appears strange that knowledge of this method of treatment has failed to reach the shores of England or America. The drug Nirvanol is formed from a combination of urea and glycol, and was at first used as a hypnotic for sleeplessness, and as a sedative in epilepsy. In chorea comparatively small doses are employed, and the successful results are not due to any hypnotic effect, but are dependent, apparently, on a specific reaction similar to serum disease, which takes place after a few days of its oral administration.

In the treatment of chorea the drug is administered by the mouth in daily doses of 5 grains (0.03 grm.) for a child of from 9 to 14 years of age. In a variable period, from 8 to 14 days after beginning the treatment, a well marked rash resembling that of measles appears accompanied as a rule by pyrexia. The drug should be stopped directly the rash is noticeable. It appears at first as tiny red macules seen on chest, abdomen and elbows, which, in the course of a day or two, enlarge and become slightly raised. From these situations it spreads to the limbs, and the extremities appear particularly affected; the macules are nearly always to be seen on the dorsum and soles of the feet and the palms of the hands. The face generally escapes. There is little irritation, but there may be slight headache and drowsiness, and conjunctivitis, pharyngitis, cervical adenitis and slight oedema of the eyelids and face are apt to occur. Continental writers state that at the outset of the rash the temperature may rise in some cases as high as 104° F. Poynton states that in his patients this high

pyrexia did not occur although the rash was well marked. The earlier the rash appears the more severe are the symptoms and the longer the duration of the temperature, but as a rule the reaction is over and the rash disappears in from three to five days. With the onset of the fever the choreic manifestations are aggravated, but with the disappearance of the rash they improve with dramatic suddenness, and are generally completely arrested within a week or ten days. Heart lesions are apparently unaffected and certainly are not made worse. In one of Poynton's cases the chorea was complicated by early carditis with dilatation, but with the arrest of the chorea the heart resumed its normal size, although an apical systolic murmur persisted. The most constant sign of the reaction is in the blood, where a true eosinophilia occurs which reaches its maximum just before the appearance of the rash. During the administration of the drug there is generally a leucopenia with a decrease of the polymorphonuclear cells, and a relative lymphocytosis. With the subsidence of the general reaction the blood picture resumes the normal. Eosinophilia appears to be a definite feature of this Nirvanol disease and may occasionally be the only evidence of reaction. Prolonged oral administration of the drug to rabbits in some instances produced changes in the bone marrow, and an aleukæmia closely resembling that occurring with benzol or salvarsan.

For this treatment of chorea to be successful the reaction must be developed and a sufficiently large dose of the drug must be given to induce it, but at the present it is wise not to exceed a daily dose of 5 grains, and the drug should be stopped at once as soon as the typical reaction, in the form of rash, fever or blood change, takes place.

The usual reaction from Nirvanol appears to be absent in certain patients, and it is interesting to note that such patients also fail to react to the various sera. The exact manner in which the drug produces its remarkable effects on chorea is not known. It is certainly not due to the mere production of fever. The writers state that they do not

* *The Lancet* 2: 267, Aug. 10, 1929.

consider the explanation to be that of protein shock.

Although the few cases treated in the great Ormond Street Hospital ran a mild and favourable course, experiments on animals would indicate that Nirvanol is not a harmless drug, and that its exhibition must be closely watched; the patient should be under careful medical supervision, and a watch should be kept on the leucocyte count to avoid any deleterious effect on the bone marrow. In rare cases alarming results have followed its administration. Keller describes a case in which the typical reaction had set in on the sixth day of the administration of the drug a striking arrest of the choreic movements followed, and the patient appeared to be cured. Eleven days later, however, a severe secondary reaction set in with high fever, headache, scarlatiniform rash, tonsillitis, nephritis, enlargement of the liver and spleen and blood-stained diarrhoea. A protracted recovery eventually ensued. This severe secondary reaction was thought to have been brought on by exposure to sunlight. A second case of this severe secondary reaction has been reported after giving artificial sunlight to a patient who had just finished his course of Nirvanol.

Good results have been reported by reliable men in various nervous clinics on the con-

tinued. Poynton reports six cases treated by this method, and so impressed was he by the prompt disappearance of the choreic movements in these cases that he considers Nirvanol of definite value in the treatment of persistent and severe chorea. There appears, however, at the present, to be some risk in this treatment; for this reason many may consider it unjustifiable to use such a potent drug to combat a self-curable disease. "We have," the writers say, "all seen the severest cases of chorea recover with only the most trifling symptomatic treatment, but we have also seen these cases develop permanent heart disease before they were finally cured of the choreic symptoms." It may be that the arrest of the chorea may prevent the rheumatic infection from reaching the heart. Should the ultimate prognosis of chorea after treatment by Nirvanol prove more favourable than it is with our present modes of treatment, then the drug indeed would seem to be a valuable discovery. The writers add that in two further cases under their care rheumatic nodules of long standing disappeared rapidly after a course of Nirvanol. Charts of the different blood examinations, and of the temperature and pulse, during treatment, are given and the details of each case treated appear in the paper from which we have abstracted the above statements.

A. D. B.

Editorial Comments

VITAL STATISTICS OF CANADA

The Preliminary Report, Vital Statistics of Canada, 1928, published by the Dominion Bureau of Statistics, Demography Branch, carries certain information which is of interest to the medical profession, inasmuch as it is some measure of the results of medical practice, and also because it is chiefly based upon reports made by medical practitioners, covering births and deaths.

The population of Canada for 1928 is estimated as 9,645,000. There occurred 236,194 living births, which number gives a birth rate of 24.5 per 1,000 population. This rate is one-tenth of 1 per cent below the rate of 1927. Three and one-tenth per cent of these births were illegitimate. There were 7,538 still-births, which is 3.1 per cent of the total births.

During the year there occurred 108,939 deaths, which gives a general mortality rate of 11.3 per

1,000 population. This rate is slightly higher than that for the year 1927, but is somewhat below that for 1926. The general mortality rate for the Province of Quebec is the highest of any province, being 13.8; the Province of Saskatchewan has the lowest rate, 7.2.

The table of deaths from certain specified causes shows that influenza was responsible for 4,697 deaths; diphtheria, 913; typhoid fever, 468; pulmonary tuberculosis caused 6,481 deaths, and of this number, 2,686 occurred in the Province of Quebec. Deaths from cancer totalled 8,511, the highest number, 3,442, having occurred in the Province of Ontario. Diseases of the heart were responsible for the highest number of deaths, 12,640. Diseases of the arteries caused 5,644 deaths; nephritis, 5,717. It will perhaps be surprising to many to know that appendicitis was responsible for 1,404 deaths; also that there were 748 suicides, 1,016 deaths due to accidental

drowning, and 1,081 to automobile accidents. Of the suicides, 284 occurred in the Province of Ontario.

Of the total of 108,939 deaths, 21,171 were those of infants under one year of age, and the total deaths under five years numbered 27,246. This means that practically one in five of all deaths are those of infants under one year of age, and that 25 per cent of all deaths were those of children under five years of age. This marks considerable progress as compared with conditions prevailing in that period not so far distant when 50 per cent of children died before their fifth year. At the same time, it is evidence of the need for further protection of the infant life of the country.

Of the infant deaths, 3,895 were caused by diarrhoea and enteritis, and of that number, 2,835 occurred in the Province of Quebec. Premature birth was the cause given in 4,576 cases, and injury at birth in 1,010 cases, both of which show rather plainly the need for ante-natal care and adequate delivery service.

If further proof were required of the need for care of the mother, it would be found in the fact that of the 1,325 maternal deaths which occurred, 438 were due to puerperal septicaemia, 329 to puerperal albuminuria and convulsions, and 172 to puerperal hæmorrhage.

Maternal mortality for the year 1928 was at the rate of 5.6 per 1,000 living births, which is identical with the rate for the year 1927. Manitoba at 5.1 and Nova Scotia at 5.2 have the lowest rates in the list of the provinces. Prince Edward Island's rate of 6.1 and Alberta's of 6.8 place them in the unenviable position of heading the list. There are slight variations from year to year in the various provinces, but during the past year there was no evidence of any decline in maternal mortality. This is in marked contrast with the infant mortality, for here we see the rate of 89.6 for 1928 can be favourably compared with the rate of 94.0 in 1927 and 101.8 in 1926, and we note that, allowing for yearly fluctuations, there is a definite downward tendency in the infant mortality rate of all the provinces. While the rate of 123.6 for 1928 for the Province of Quebec is a challenge to the health work of that province, it shows a decided gain over the rate of 142 for the year 1926.

A perusal of the report focusses attention upon the number of deaths which occur from diseases which should be rare. We are apt to think that sanitary measures have been thoroughly applied in this country. That such is not the case is evidenced by the 468 deaths caused by typhoid fever, which would not have occurred if the proper control had been exercised. Diphtheria, which was responsible for 913 deaths, is one of the few diseases for which means of prevention and cure are available.

Tuberculosis is no longer the chief cause of death, but that there remains much to be done cannot be doubted when it is found to have caused 7,848 deaths in one year.

It would also appear that, considering the tremendous toll of lives taken by diseases of the heart, arteries and kidneys, the problem of the prevention or, at least, of the early detection and treatment of these diseases is an outstanding challenge to medical science. GRANT FLEMING

DR. CHARLES E. DE M. SAJOUS

Dr. Charles E. de M. Sajous, a pioneer and noteworthy investigator in the field of endocrinology, died on April 27th, at the age of seventy-six years.

Dr. Sajous was of French birth, the son of Count Charles Ronstan de Medicis-Jogoigne, the head of a Franco-Flemish family of that name in Florence, Italy. He began the study of medicine at the University of California, and received his degree in Medicine from Jefferson Medical College in 1878.

During his long life Dr. Sajous held not a few academic positions. He was appointed Professor of Anatomy and Physiology at the Wagner Free Institute in 1881; Clinical Lecturer on Laryngology at Jefferson Medical College in 1883; Professor of Laryngology at the Medico-Chirurgical College, and Dean of the Faculty, in 1897. From 1910 to 1922 he was Professor of Therapeutics at Temple University, and was made Professor of Applied Endocrinology at the University of Pennsylvania in 1921.

Dr. Sajous was an active member of many of the American Societies, frequently serving as president. He was American Gold Medallist in 1922. Nor did he fail to receive recognition abroad. He was an Officier d'Académie of France; a Commander of the Order of the Liberator of Venezuela; a Commander of St. John of Jerusalem of Spain; a Knight and Officer of the Legion of Honour of France; a member of the Humane Society of Belgium.

Dr. Sajous was a man of nimble mind, ever on the alert for new ideas, ever discovering new applications for old ideas, and had to a marked degree the inventive faculty. He devised several instruments for use in laryngology.

He will be best remembered in time to come for his great interest in the subject of the internal secretions, which he made peculiarly his own. He became editor in 1888 of the *Annual of the Universal Medical Sciences*, which, in 1896, became the well known *Sajous' Annual and Analytical Cyclopædia of Practical Medicine*, a monumental work which gained him world-wide recognition, and by which his life achievement will mainly be judged. In 1903 he brought out the first important treatise on *The Internal Secretions and the Principles of Medicine* which

although issued in two volumes has run through eight editions. Dr. Sajous was a brilliant man, and his death is a great loss to medicine.

A.G.N.

THE BRITISH MEDICAL ASSOCIATION

As our readers are, doubtless, all aware, close and friendly relations exist between our Canadian Association and its older sister in Great Britain. Our affiliation with the British Medical Association is indeed a matter of great gratification to us. We are pleased to be able to say, also, that our two *Journals* are beginning to draw closer together. Last month, by the courtesy of the Editor of the *British Medical Journal* we were enabled to publish in our columns, from an advance copy, the Address of the President of the British Medical Association at the last meeting in Manchester. Now we are able to announce that in our November issue will appear an important address by Mr. Sampson Handley on the genesis of cancer, sent to us by the expressed desire of the author himself. We may say now that we shall be glad to receive other papers from Great Britain and, indeed, from any part of the Empire. We are, further, privileged to announce that arrangements have been made whereby material appearing in the *Canadian Medical Association Journal* will receive increased consideration in the pages of our contemporary. This is but as it should be.

The British Medical Association was founded by Sir Charles Hastings in 1832, and is, consequently, in its ninety-seventh year. At its first meeting there were fifty members. By 1854 the membership was 2,000; in 1912 it was 26,568; in 1929 it is more than 34,000, representing a net increase of 14,000 since the war. The *British Medical Journal*, the Association's official organ, was first published in 1857. Its issue has not reached the magnificent figure of more than 3,000 copies weekly. This is a splendid showing and we offer our congratulations. We would express the hope that our own Association and its *Journal* will do as well in proportion.

The combined meeting of the British and Canadian Medical Associations, to be held next year in Winnipeg, is arousing keen interest here, and should serve to draw the bonds still closer. Canadians generally hope that their confrères from Great Britain and other parts of the Empire will forgather here in force in 1930.

A.G.N.

TUBERCULOSIS IN MANITOBA

Something of the steady and growing work which is carried on by the staff of the Manitoba Sanatorium may be gathered from the following notice of its program in the July number of the *Manitoba Medical Association Bulletin*:

"For the fourth consecutive year the staff of

the Manitoba Sanatorium is planning clinics here and there throughout the province. This year we will try to visit almost every section. We will have our own portable x-ray machine and use plates freely. As in former years, the Provincial Public Health Nursing Service will co-operate.

We wish to see those who have been in contact with tuberculosis, or are suspected of it, or are definitely tuberculous, or any others our experience can help. In short, we wish to do as much as we can for as many as we can reach.

We wish these examinations to be arranged in every case through doctors in attendance, and whenever possible to be made with the doctor present. Reports are sent to doctors, not to patients. In some communities, where patients have seen several doctors, reports are sent to all doctors.

No charge will be made, since we do not want any suspected person to have any reason for staying away. . . ."

The list of places to be visited is to be in addition to three clinics already held early in July, at Somerset and Virden, at which more than 400 patients were examined.

H.E.M.

A EUROPEAN TOUR OF CANADIAN DOCTORS

Even if one had not observed the name of the author on the title page there would have been little hesitation in ascribing to Dr. D. A. Stewart, of Ninette, the interesting "Travel Notes" describing the recent European tour of Canadian physicians specially interested in the fight against tuberculosis. The notes are written with all Dr. Stewart's pleasant vivacity and unfailing freshness, and form not only interesting reading, but will also be found to contain many thoughts and facts of much practical value.

The various centres of anti-tuberculosis work in England, France, Switzerland and Italy were visited, and the principal features of each are well described. Anti-tuberculosis efforts in England and France are shown to be in great measure regarded as a part of public health work, but considerable room is left for voluntary effort. Much was learned from the various methods and measures employed in the several sanatoria visited all so willingly shown and explained to the travellers in every medical centre. The lectures delivered by Dr. Menzies of the London County Council, Sir George Newman, and Dr. Coutts, are well reported,

* "Travel Notes" by David Alexander Stewart, B.A., M.D., LL.D., Medical Superintendent Manitoba Sanatorium, Ninette. With Foreword by T. B. Macaulay, F.I.A., F.A.S., F.S.S. European Tour of Canadian Doctors, Associated with Tuberculosis Sanatoria and Clinics, September to October, 1928. Organized by the Canadian Tuberculosis Association. Assisted financially by the Sun Life Assurance Company of Canada.

and are worth careful study. Papworth Village settlement still remains a unique example of a well ordered self-sustaining village where earnest workers, disabled by tuberculosis, may keep hands and minds occupied, and feel that, with care on their part, life's problems for themselves and their families are permanently settled. Dr. Stewart, in his closing remarks, writes that the several members in the trip had daily and hourly stimuli to their thoughts on the treatment of tuberculosis, and on measures concerning the broader matters of general health. The tour undoubtedly proved to all the members both pleasurable and instructive, and these travel notes will emphasize many afets learned during it which might otherwise be forgotten.

The publication of this booklet is due to the broad-minded and, we believe, wise generosity of the Sun Life Assurance Company of Canada, who also bore the larger portion of the expense of the tour. "Travel Notes" is fittingly accompanied by a foreword from the president, Mr. T. B. Macaulay. A.D.B.

MEDICAL REPORT OF THE UNITED FRUIT COMPANY*

The seventeenth annual report of the medical department of the United Fruit Company, of Boston, has been received, and contains the reports of the several medical officers of the company, together with a summary of the work done at the various districts in the tropics in which their numerous farms and office buildings are situated. The volume opens with comments on the more important diseases which occurred during the past year in the several tropical districts. Then follow a series of papers on malaria, containing an account of much experimental work and many observations on treatment, with special reference to measures for the control of this disease. In a paper Dr. Brosius of Panama states that although authors generally consider that treatment with plasmochin is not safe, except under immediate medical supervision, this drug when combined with quinine and employed in limited dosage is not only safe but has proved extremely valuable in the aestivo-autumnal form of the disease, and appears to be particularly destructive to the crescentic form of the parasite. It is well of course to direct that the tablets containing the combination of the two drugs (plasmochin 0.01 gm. quinine bisulphate 0.125 gm.) should be used with care, but the risk of by-effects when these tablets are employed in a district suffering severely from malaria is more than out-

balanced by their effectiveness. Among the papers appearing in the third section of the report are a series of excellent case reports on many of the special forms of disease met with in the tropics. A section is also given to studies on various blood conditions, abstracts of reports on cases of snake bites, and reports on several interesting post-mortems. The volume contains more than fifty papers, all of them of a most interesting and instructive character. The United Fruit Company is to be congratulated upon the good work carried on by its medical department and upon the series of annual reports which it publishes, all of them containing valuable medical papers on the diseases met with in tropical districts. A.D.B.

THE CANADIAN JOURNAL OF RESEARCH

We note with pleasure the birth of the *Canadian Journal of Research*. This journal is issued by the Research Council of Canada as a medium for publishing the increasing number of scientific papers produced by Canadian workers. The Journal was planned originally for publication of work done under the auspices of the National Research Council, but it is also open for suitable papers from Canadian workers not connected with the Council. In this way it is hoped that it will serve to reflect the progress of scientific and industrial research throughout Canada.

It is especially notable in the first two issues how much research work, both in matters relating to husbandry and in biological problems, is being carried out in the western universities at Edmonton and Saskatoon. H.E.M.

We greatly regret to learn, just as we go to press, of the death of Dr. S. R. Jenkins, of Charlottetown, P.E.I., from pneumonia. Dr. Jenkins was elected to the high office of President of the Canadian Medical Association at the meeting in Charlottetown in 1928. He was at the Montreal meeting last June, apparently in good health and spirits, and his demise so soon after comes as a great shock to his hosts of friends. A fuller notice of Dr. Jenkins will appear in our next issue.

A BOOKLOVER'S PLAINT

If thou art borrowed by a friend,
Right welcome will he be
To read, to study, not to lend,
But to return to me;
Not that imparted knowledge doth
Diminish Learning's store,
But books, I find, if often lent
Return to me no more.

* Seventeenth Annual Medical Report of the United Fruit Co., Boston, 1928.

Special Articles

THE CAPILLARIES AND THE MORE IMPORTANT FACTORS WHICH CONTROL THEIR ACTIVITIES

A REVIEW*

BY A. D. BLACKADER, M.D., LL.D.,

Montreal

Dr. Dale at the outset of his Oliver-Sharpey lectures¹ on the activities of the capillary blood vessels, delivered in 1923, emphasized the importance of recent advances in our knowledge regarding the function of the capillaries as an active factor in the circulation; and went on to say that but a few years previously any discussion regarding the activities of the capillaries, and of the part taken by them in the general circulation, was limited to the question whether their primary function of facilitating chemical interchange between the blood and tissues involved an active secretion, or could be wholly explained by the physical processes of filtration and osmosis. Records, indeed, were not wanting of appearances seen under the microscope difficult to interpret except by attributing to the capillary walls an independent power of contracting and relaxing. The prevailing tendency, however, until quite recently was to provide some simple explanation for these appearances, or when active contractility in the capillary walls was admitted as a possibility, to regard it as a remnant of an embryonic condition which in the higher vertebrates played no real part in the regulation of the blood stream.

Lister² in 1858 in his classical paper on "Inflammation" described appearances in these vessels which to-day would be attributed to active changes in their size and tone, but which tradition was strong enough to lead him to regard as secondary to changes of pressure produced by alterations in the tone of the arterioles. Rouget³ in 1873 described special contractile cells encircling the vessels with delicate protoplasmic processes; and Roy and Graham Brown⁴ produced convincing evidence of the independent tone and contractility of these vessels, but little attention was paid to their statements. More than twenty years later, Mayer,⁵ in 1879, repeated and in 1903 confirmed these observations, and Steinach and Kahn⁶ in the same year demonstrated contraction in response to stimulation, and added the important fact that

capillaries have a motor nerve supply from the sympathetic system. Nevertheless, for the next fourteen years, these observations had little influence on physiological teaching, and the rôle of the capillaries in the circulation was still regarded as one of passive obedience to external forces.

Thought became more active during the war, and in 1917 a paper by Cotton, Slade and Lewis⁷ once more drew attention to the reaction of the capillaries in the human skin as manifested in dermatographia, and demonstrated that both the red and the white tache must be attributed to an intrinsic contraction of the capillary wall. Hooker,⁸ in a paper published in 1920, confirmed the accumulating work of other observers regarding the presence of a motor supply to the capillaries in the sympathetic nerves, and added the significant observation that stimulation of the true sensory nervous fibres arising in dorsal root ganglia not only causes dilatation of arterioles but also an independent relaxation of the capillary walls. Shortly afterwards, Krogh,⁹ impressed by the increased demand for oxygen by working muscles, as compared with the needs of resting muscles, showed, by means of an injection of India ink into the vessels, the greatly augmented amount of blood which passed through capillaries dilated in response to the requirements of active muscular fibres.

Investigation of the nerve supply to the capillaries at this date, 1920-1922, was being actively carried on in many laboratories. That stimulation of the sensory groups in the cord produced a dilator effect on the capillaries was confirmed by several workers. Vimtrup,¹⁰ working at the suggestion of Krogh, reinvestigated the minute histology of the capillary motor mechanism, and fully confirmed and extended the descriptions given by Rouget and Mayer of the flat branching contractile cells on the outside of the endothelial wall of the capillaries, girdling it with fine processes; and described the connection of this contractile coat on the capillaries with the plain muscle coat of the arterioles on the one hand, and of the venules on the other, and the intermediate forms found at the transition ends in both directions.

Such evidence compels us to regard the capillaries as possessing an efficient independent contractile coat with motor and inhibitor nerve fibres, and having an important function in producing the fine adjustments of the local circulation demanded by local needs. The relatively coarse adjustment effected by the varying tone of the arteries secures for the individual the vascular tone demanded for an efficient general circulation, while the capillaries effect the fine

* Chiefly abstracted from the Oliver-Sharpey lectures of 1923 and the Croonian lectures of 1929 delivered by Prof. H. H. Dale, M.D., F.R.C.P., F.R.S., Director of National Institute for Medical Research, before the Royal College of Physicians in London.

minor adjustments necessitated by local requirements in the several systems, and by local irritation and injury. In the Oliver-Sharpey lectures of 1923, Dale drew attention to the changes in the capillaries produced by the action of certain poisonous-protein derivatives, as they were then deemed, and the influence of these changes on problems in physiology and pathology.

The subject of the capillary circulation has again been chosen by Professor Dale¹¹ for the topic to be discussed in his Croonian lectures of this year, but on this occasion with greatly advanced knowledge. In them he deals with the action of certain chemical factors, now known to be developed in the body, and which have a very definite action in effecting with certainty, and in graded intensity, changes in the tone of the blood vessels.

So recently as in the year 1926 attention was drawn by Sir Thomas Lewis¹² to the evidence of the liberation from injured or irritated cells of a chemical substance closely resembling histamine in its action, and apparently responsible for the vasodilatation and wheal formation in the immediate neighbourhood of the lesion. Since then, evidence from many sources has been accumulated regarding other chemical factors existing in the body which have a definite action on the circulation, for the most part reinforcing and supplementing the recognized mechanisms of nervous control.

Attention was first called by Professor Dale to the part played in the control of the circulation by substances which have claims to be regarded as hormones in the true sense, using the word hormone as first applied by Bayliss and Starling to active principles formed in one organ and carried by the blood to effect their pharmacodynamic work in another. These substances are; (a) *adrenalin*, considered by Dale as a perfect type of such a hormone, and (b) the pituitary vasoconstrictor principle, *vasopressin*, which in the light of its recent isolation from other principles in the gland may be regarded as having also a presumptive claim to be included as such. Each of these is formed locally in an organ having the specific function of its production, and is distributed by the blood to all parts of the body, affecting all blood vessels which are specifically sensitive to its stimulus. The fact that both these general circulatory hormones are predominantly vasoconstrictor in their action is worthy of note. Apart from this action, the two differ widely in what we know of their chemical nature, of their modes of action, and of the conditions under which they are secreted.

Adrenalin.—Our knowledge of adrenalin and of the details of its action is more complete than is that of any other hormone. A relatively simple basic derivative of catechol, it was successfully produced by synthesis many years ago. It is readily destroyed by oxidation, and quickly disappears from the blood. Its action is there-

fore an evanescent one, unless it is injected in large quantities. It reinforces the accelerator and augmentor effects on the heart beat, and increases or inhibits the functions of different contractile or secreting cells in response to sympathetic impulses. As the output of adrenalin is under the nervous control of the splanchnic nerve fibres in the suprarenal medulla, in response to any sudden emotion an increased amount of it is thrown into the circulation in adaptation to the physiological needs of the system at the time.

Although adrenalin would appear to be carried in almost equal concentration to all parts of the body, its action on the blood vessels in response to sympathetic impulses may vary in intensity and even in direction, and thus induce variations in the vascular tone in different systems. The vessels of the gastro-intestinal canal are apparently in all animals more sensitive to the vasoconstrictor effect than are those of the skeletal muscles, so that a small dose of adrenalin entering the general circulation tends to produce a redistribution of the blood supply in favour of the skeletal muscles, and at the expense of the vessels of the alimentary canal. In some cases even a vasodilator effect appears to be induced by minute intravenous doses. Dale and Richards¹³ were able to detect evidence of such a vasodilator effect in the cat and in the dog, favoured possibly by the concomitant action of a small amount of histamine absorbed from the intestinal tract. By this means a physiological condition favourable to digestion was replaced at the call of sudden anger or fright by a promptly increased blood supply to the skeletal muscles; a condition suitable for muscular activity.

Another condition in which the action of adrenalin effects a redistribution of the blood supply in accordance with the functional need of the animal was brought out in recent experiments. It concerns the control of the blood flow through the liver of the dog. The branches of the efferent hepatic veins in this animal are furnished with stout coats of plain muscle, very sensitive to the action of histamine, which stimulates their contraction, thus to some extent damming back the blood in the capillary spaces of the liver. During the process of digestion, the histamine absorbed from the bowel maintains this contraction and checks the venous outflow, inducing an accumulation of blood in the liver, and in the viscera drained by the portal vein. Under the stimulus of sympathetic impulses assisted by an increase in the secretion of adrenalin this constriction is lessened. Dale calls attention to the physiological significance of such a mechanism. At a sudden call for vigorous muscular action an increase in the supply of adrenalin opens widely the hepatic sluice, and releases for the needs of the whole organism blood which during digestion had been filling the capacious capillary bed of the liver.

Finally, another of the notable exceptions to the predominantly vasoconstrictor action of adrenalin is provided by its dilator effect in correspondence with the dilator action of the sympathetic nerves of the arteries supplying the heart.

Vasopressin.—The pituitary vasomotor principle presents a contrast to adrenalin in many respects. Though its existence was recognized in 1895 by Oliver and Schäfer¹⁴ our knowledge of its chemistry is still very meagre. Only recently has the complete separation of the two active principles in the secretion of the gland been effected. Vasopressin, with an active constrictor effect on the capillaries and with but slight action on the uterus, has been separated from oxytocin, which has a powerfully stimulating action on the uterine muscle and but little on the vessels. It is possible that there may yet be separated a third therapeutically important principle with a definite antidiuretic action, but this has not yet been effected. Our immediate concern is with vasopressin, and its function in regard to the circulation. Of its chemistry we know little. It is moderately stable when boiled in acid solution but easily destroyed by alkali. Its action in the system persists long, and even after its apparent subsidence the vessels remain for some time relatively insensitive to further injections. It is difficult to believe that a substance so potently active on artificial injection, should be concentrated in a structure with no recognizable method for its supply through the blood to the tissues and no evidence of any nervous influence by which the amount supplied can be made to vary at the call of any emergency. Cushing and Goetsch¹⁵ long ago put forward evidence in favour of its passage from the lobe into the cerebrospinal fluid. It has never been proved, however, that the active principle leaves the gland by this route. The gland and its posterior lobe are well supplied with blood vessels, and it is difficult to suppose that the blood passing through a tissue so highly charged with such diffusible principles should fail to carry away sufficient for the requirements of the system.

So far as our knowledge at present permits any statement to be made regarding its function all that can be said is that vasopressin appears to produce its effect on the circulation by increasing the tone of the arterioles without any reference to their nerve supply. Artificial injections of an extract of the pituitary lobe, or of its vasopressin principle, into the blood vessels of a human patient or into an anæsthetised or decerebrate mammal, produce definitely impressive results.

Dale,¹⁶ however, states that he knows of no evidence to indicate a recognizable loss of capillary tone following removal of the pituitary posterior

lobe in the mammal. The results of such an operation except on the diuretic function appear from the records to be remarkably small. The same thing holds true of the destruction of the medulla in both suprarenal glands, a destruction which is not only compatible with indefinite survival, but is also without any discernable effect on the general vascular tone of the animal.

Such absence of obvious change in the efficiency of the normal circulation when the supply of one or other of these hormones is cut off will appear less surprising if we consider them as auxiliary factors in the multiple provision of nature for the maintenance of an efficient vascular tone. We have in the first place the vasomotor centres acting through the sympathetic nerves. In emergency their action is reinforced by an accelerated output of adrenalin. The function of the pituitary hormone may be to provide yet another safeguard against circulatory collapse by a general indiscriminating maintenance of tone in the small blood vessels. Such a conception of its function would render intelligible the otherwise curious discrepancy between the trivial effects on the arterial pressure and general circulation which its injection produces in a normal individual, and the remarkable restorative action which it exhibits on vascular tone and the efficiency of the circulation, in the victim of primary surgical shock or vasomotor collapse.

Histamine.—Histamine first came into prominence as an intensely active base capable of producing lowered blood pressure, and symptoms resembling anaphylactic shock; to its action was attributed the toxæmic collapse which occurred in severely wounded soldiers in the early years of the war. The first claim to the chemical identification of histamine as the essential depressor constituent of animal tissues was made by Abel and Kubota¹⁷ in 1919. They isolated histamine salts from tissues examined by them.

Sir Thomas Lewis¹⁸ in his Croonian lectures of 1926 described an experimental study of the local vascular reactions seen in the human skin. From whatever provocative stimulus the reaction developed, it presented a characteristic threefold complex, a local red reaction due to dilatation of the minute vessels, a wheal succeeding this, and coincident with this dilatation a surrounding irregular flare due to dilatation of the larger arteries. The two former were independent of nerve supply, and due to the liberation from the injured cells of some chemical substance. The last appeared to be due to a local axon reflex. Sir Thomas Lewis had no exact knowledge at that date regarding the chemical agent, but found that among known substances histamine reproduced the complex exactly when introduced in minute doses into the epidermis. Histamine at that time was not regarded as a constituent of the normal tissue.

An opportunity for a more complete investigation of the depressor constituents of tissue extracts was afforded Professor Dale by the fact that during the year 1926 claims were made both in Canada and the United States regarding the therapeutic value of an extract prepared from the liver as a specific in the treatment of high blood pressure. Professor Best of Toronto, who was at the time due to spend some months in the Research Laboratories, brought samples of this liver extract with him, and indicated the method by which the different batches of this extract could be physiologically controlled. A large supply of liver extract was in this way made available for investigation. On examining it, the presence of two different active principles were easily recognized. One had an action resembling that of choline, affecting chiefly the stronger arterioles, the other an action resembling histamine, with an action on the minute vessels and capillaries. An artificial mixture of choline and histamine was easily prepared, the action of which was indistinguishable from that of the liver extract. Eventually from these alcoholic extracts of perfectly fresh liver both choline and histamine were obtained in a pure form and in sufficient quantities to ensure complete chemical identification, thus rendering it unnecessary to suppose that any other more complex and unidentified principles contributed to the depressor vasodilator action.

It was possible now with some confidence to assume that a histamine-like action in an extract of an organ was due to the presence of histamine itself, and a rapid survey for histamine was made in a number of organs. At the same time, an attempt was made to determine whether the histamine extracted from a tissue, such as that of the lung, was present during life or was formed rapidly after the death of the cell. A lung taken from a living anaesthetized animal was frozen immediately in strongly cooled alcohol before mincing, and was found to yield as much histamine as the other lung left for two hours in the dead body before removal. The conclusion was drawn therefore that histamine must either pre-exist during life or be formed in the very act of cellular death, and therefore histamine had a good claim to be regarded as a normal constituent of the living cell.

Lewis¹⁸ and his colleagues were reaching similar conclusions independently. They had evidence that the living cells of the skin when subjected to irritation or injury liberated a substance remarkably like that of histamine. It had been shown in their laboratory that the cells of all organs under the most conservative methods of artificial extraction apparently contained histamine. Lewis, however, hesitated to acknowledge this as an absolutely proven fact, and preferred to refer to the substance liberated in his laboratory as the H substance.

The two important actions of histamine, namely, a direct dilatation of the minute vessels and a reflex dilatation of the larger arterioles as described by Lewis differ in the relative amounts of each experimentally induced in different mammalian types. The frog, however, is a definite exception, and by the absence of any vasodilator action from either histamine or Lewis's H substance manifests apparently complete insusceptibility to the action of this principle.

Viewed as a whole, the evidence would indicate that histamine is a generally distributed constituent of the cells in the normal body, inert while it remains in the cell, but intensely active in producing local dilator reactions when appropriate stimuli release it from the cell into the tissue fluid, either free or in molecular combinations of varying complexity.

To glance for a moment at other effects of histamine than those on the minute blood vessels, the special activity which first brought it into notice was its intense stimulation of the plain muscle of certain hollow viscera, particularly, those of the uterus and the bronchi. Released by stimulus or injury from plain muscle, it gives rise not only to vascular dilatation in the local capillaries but also to a definite contractile reaction in the muscle cells directly injured or in others in their immediate neighbourhood. The fact that lung tissue, which contains so high a proportion of endothelial cells, contains also by far the largest amount of histamine, suggests that endothelial cells must be rich in this base. The physiological significance of this amount of histamine in the lung must be regarded as a problem awaiting solution.

Considering all the evidence regarding the normal physiological functions of histamine, it may be stated that its action is practically limited to the immediate neighbourhood of its liberation. The very limitation of its distribution may by itself be regarded as implying for it a localized function as distinguished from the more generalized function of the hormones distributed by the blood stream. The liberation from an active cell of a substance like histamine, acting on the minute vessels in its immediate neighbourhood, should provide an excellent mechanism for the fine adjustment of the blood flow to the fluctuating needs of small tissue units.

Our early knowledge of the activity of histamine was associated with the development of symptoms resembling those of anaphylactic shock. The knowledge was then new that an artificial product of protein digestion such as the familiar Witte's peptone when injected into a vein reproduced the characteristic symptoms of anaphylactic shock. When the action of such a simple substance as histamine was found to produce many of the principal features of shock, it was natural that it should be identified with its cause. Histamine may be liberated from or

in the immediate neighbourhood of reacting cells; and on the other hand some anaphylactic injury of the cells of some large organ, such as the liver, may liberate histamine into the general circulation in such quantity as to produce its effects in the body generally. That these two types of reaction do occur, one in the guinea pig and the other in the dog, would appear to be indicated by experiments;¹⁹ but it was found that such results from histamine in the immediate neighbourhood of its release, when distributed by the circulation, do not complete the picture of an anaphylactic reaction. The latter involves effects of a more injurious and lasting nature than any which direct injection of histamine can produce.

There is a large group of pathological reactions produced by natural infections, and by the artificial injection of various substances into the blood stream, which more or less closely resemble the symptoms seen in the anaphylactic or allergic reactions. When once it is realized, however, that any kind of cell injury which leads to the release of intracellular histamine must be followed by symptoms of histamine poisoning, the difficulty of disentangling the different parts of the total effect will be realized. The liberation of histamine will not by itself account for all the symptoms in anaphylactic shock. Moreover, we have no justification for assuming that histamine is the only cell constituent which injury liberates. More severe injury of any kind must be expected to introduce other elements into the reaction, and it may do this either by causing liberation of other and unknown cell constituents, or by directly affecting the physiological integrity of the endothelium of the reacting vessel. As the reaction becomes more frankly pathological the effects of histamine fail more and more to fill the picture.

Acetyl-Choline.—Attention must now be directed to the action of an entirely different vasodilator substance, which resembles histamine in certain features of its scientific history. Choline has long been known as a constituent of the normal body in which it enters into the constitution of the group known as lecithins. Like histamine it was made in a chemical laboratory before it acquired physiological interest. It has for some time been known to produce a depressor effect when injected into the mammalian circulation. On making a systematic investigation of its action, the remarkable parallelism between its effects and those produced by stimulation of the parasympathetic nerves was observed. When Reid Hunt²⁰ confirmed the predominantly vasodilator nature of acetyl-choline in almost incredibly minute doses he was struck with the resemblance between its effects on the vessels in the limbs, and those produced by stimulation of the appropriate sensory nerve routes. During more recent years the activity of this acetyl-choline has gained interest in several directions.

Apart from its parasympathetic and vasodilator effects in minute doses readily annulled by atropine, acetyl-choline, injected in doses after the atropine, exhibits a powerful action on ganglion cells, similar to that which nicotine is known to produce.

There appears also to be definite evidence in favour of the view that the vagus produces its effects on the heart muscle, not by direct passage of the impulses to the effector cells, but by liberation in relation to them of a substance having an action similar to that hitherto associated with stimulation of the vagus, and having the properties of an unstable choline ester. The evidence needed to justify this assumption was the discovery in some normal organ of a substance having the physiological properties and chemical identification of such a substance. Opportunity was presented to Prof. Dale by a chance observation. In completing a series of investigations on the distribution of histamine in the spleen an additional substance was found which had a surprisingly powerful choline action. Investigation showed that chance had presented us in this tissue with an intensively active and unstable choline ester, which was present in the animal organ, but in too small an amount for isolation. Careful investigation indicated it to be unstable to alkali, but to have the power of lowering arterial pressure, stimulating isolated intestinal muscle, and producing an abnormally slow contraction of denervated voluntary muscle; actions exactly resembling those of acetyl-choline.

In the case of the inhibition of the heart by the vagus,²¹ the liberation of acetyl-choline in relation to the heart muscle seems to fit the known facts, including the annulment of both vagus and acetyl-choline reactions by atropine; it appears also to be the only known substance that can do so. We are probably right therefore in regarding acetyl-choline as the agent concerned.

For the autonomic system in general, the view that the arrival of nerve impulses at the peripheral endings may act on the effector cells indirectly through liberation of a chemical agent is not of recent origin. Elliott,²² as long ago as 1904, suggested that the true sympathetic nerves might so act by the liberation of adrenalin at their synaptic unions with plain muscle and gland cells. Such a conception is now supported not only by analogy with parasympathetic effects, but by the direct observation made by Loewi,²³ and confirmed by others, that the sympathetic accelerator effect on the isolated frog's heart involves the liberation of an accelerator substance. It would be rash to assume as yet that adrenalin is the substance in question. The case made for acetyl-choline, as the transmitter of parasympathetic and sensory collateral vasodilator effects is based partly on the chemical

behaviour of the vagus substance, and partly on the reproduction by the nerves of another aspect of its action unconnected with parasympathetic effects. That other sympathomimetic substances may occur in the tissues is suggested by the effects of certain extracts recently described by Collip.²⁴ Whatever be the nature of this suggested chemical intervener between sympathetic impulses and effector cells, it can serve only as the transmitter of sensory originated impulses. We have as yet no evidence for the localized peripheral release of adrenalin, or of any substance acting like it.

Broadly, the contrast indicated in an earlier lecture appears to hold good. Vasoconstrictor effects, whether produced by nervous impulses or by hormones, are centrally originated and widely distributed, and are concerned with the upholding and mass variation of vascular tone. Vasodilator effects are largely, though not entirely, local reactions, chemically originated, and concerned with the finer adjustment of blood supply to local requirements.

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MATERNAL MORTALITY

By J. R. GOODALL, M.D., D.Sc.,

*Clinical Professor of Obstetrics and Gynecology,
McGill University,*

Montreal

Mortality in motherhood has been a subject of much learned discussion and writing during the past year or two. Aberdeen in Scotland was one of the first cities to take up the subject as a community effort to lessen the death rate during the puerperium. A commission was appointed to approach the subject from every possible angle and to co-operate, in the most generous sense of the word, with the doctor and midwife. The commission did their work with such fine appreciation of the sensibilities of the midwives and obstetricians, that a degree of co-operation was obtained that was most praiseworthy. Anything even with the faintest flavour of the inquisitorial was eliminated, and the medical and midwifery circles were at once impressed with the knowledge that here was a body of sincere men, men eager for the truth, and the truth was given willingly and not by extraction. This is stated at the outset because the results of the work of this commission have led to highly probable conclusions which may go far towards the formation of new national obstetrical policies.

The results of this commission have led to the formation of a similar national body established by the British Ministry of Health. This Royal Commission will be of similar scope to that of Aberdeen, but will extend not over one city only but over the whole of England and Wales. The results of this inquiry may come to us in parcels during the working stages of the commission, or the reports may be reserved until the work of the commission is completed. In the latter case it may be from five to ten years before the results are available. However, as the Aberdeen report forms the basis of most of the learned discussions upon maternal mortality, it will be well to quote from it somewhat briefly.

1. The analysis of the records of maternal deaths in Aberdeen over a period of ten years, as obtained by means of a special system of inquiry, has not revealed any definite relationship between environmental conditions and puerperal mortality. Thus, in turn, puerperal mortality in relation to cleanliness of house, size of house, crowdedness of house, and to congested areas, has been examined, and no significant association of any of these conditions with puerperal mortality has been ascertained.

2. Similarly, the influence on maternal mortality of more personal factors, such as age of the mother, illegitimacy, occupation of the mother, habits of the mother, health of the mother before and during pregnancy, previous births and syphilis, and sequence of pregnancies, has been examined, with results that confirm generally existing

views as to the influence of these various factors on maternal mortality.

3. The comparative maternal death rates from all causes and for the separate causes of death in the practices of doctor, midwife, district, and institution have been analyzed, the factor of selection being eliminated by transferring the case back to the original doctor or midwife in charge of the case, and it has been found that the death rate per 1,000 maternity cases is 2.8 in the practice of midwives, 6.9 in the practice of doctors, and 14.9 in in-patient institutional practice.

4. The evidence indicates that, in so far as midwifery are concerned, the application of the midwifery forceps has no prejudicial effect on the mother.

5. Statistical evidence has been obtained of the reduction in maternal mortality which accrues from the provision of ante-natal services.

6. There is reason to believe that the high incidence of puerperal sepsis in maternity institutions in Aberdeen is due to contagion.

7. The view is advanced that the higher incidence of puerperal sepsis in the practice of doctors as contrasted with that of midwives is also due to contagion, being dependent in considerable part on a streptococcal-carrier condition in doctors.

8. It has been shown conclusively that the streptococcus hæmolyticus plays by far the most important part in the causation of puerperal sepsis.

9. It has again been demonstrated that the same type of hæmolytic streptococcus can, on occasion, produce puerperal fever, scarlet fever, erysipelas, and pyogenic infections.

10. The evidence goes to show that an expansion and improvement of ante-natal services will result in an important reduction in maternal mortality.

11. The evidence supports the view that the development of a new midwifery organization in which midwives conduct all normal deliveries, and in which doctors provide the ante-natal services and deal with obstetrical complications, will result in a significant reduction in puerperal mortality.

12. It has been shown that if the risk of contagion in maternity hospitals is to be restricted, then the number of patients and their spacing in the wards must be rigorously controlled.

13. So far as the specific prophylaxis of puerperal fever is concerned, it has been shown that, while the exotoxins of the streptococci causing puerperal sepsis can be neutralized by any monovalent streptococcal antitoxin, the destruction of the organisms is only likely to be secured by the production of a type (serological) specific antibacterial serum.

To anyone who will carefully read over the above paragraphs it will become evident that there is food for much thought. It will come as a shock to many that institutional maternal mortality is five times higher than midwives' maternal mortality, and that doctors' maternal mortality is, roughly, twice that of the midwives. This cannot be passed over lightly; it demands our most serious study. One is reminded of the Vienna obstetrical clinic in 1848. The then largest obstetrical clinic was divided into two sections. One was under the supervision of and worked by the midwives; the other was under the administration of Semmelweis and his staff. The students received their instruction under Semmelweis, but were not allowed to enter the clinic run by the midwives. The

mortality from sepsis was always higher in the surgical half of the hospital, and in times of epidemic the death rate reached 30 to 35 per cent. This difference between the two administrations soon became common knowledge. Patients were not allotted to any part of the hospital until they came for admittance in the first stage of labour. It is written that when allotted to the doctors' section by the admitting officer they would frequently throw themselves on their knees and beg to be sent to the midwives' section. Semmelweis, in trying to find the cause, realized for the first time that the students and staff attended autopsies and came direct from the autopsy room to the obstetrical clinic. This was the only outstanding difference between the technique of the midwives' section and the physicians' section and, therefore, was considered the probable cause. The remedy was applied with success. To-day, with a much reduced mortality, the proportionate mortality is the same as between midwife practice and physicians' obstetrical work. This does not redound to the credit of the physicians. Moreover, there are no students in this case, so we must seek the cause elsewhere.

Not all of the thirteen conclusions cited above are of equal value. Some are self-evident; others are of singular interest, and debatable. But, clearly, it behooves all of us to try to find the solution of the difficulties.

Clause 5 deals with the effect of ante-natal care upon mortality. Those who, for the past ten years, have followed the results of ante-natal care and instruction, cannot but be struck by one or two outstanding improvements. First of all, let it be stated that the main causes of maternal mortality are sepsis, toxæmia, and hæmorrhage. The most notable change as a result of ante-natal care is seen in the enormous reduction in the incidence of eclampsia. This result is attributable entirely to the dissemination of knowledge of its symptoms and dangers. Cases are now recognized early and preventive treatment is applied early, and the singular part is that preventive treatment not only prevents eclampsia but very frequently cures the toxæmia. As a consequence also of the ante-natal clinic, nephritic cases are recognized early and appropriate treatment is begun before the damage is irreparable. When one considers that so much has been done in the past few years in the matter of ante-natal care, one need not be a visionary to expect that eclampsia will become an exceedingly rare accident in the not far distant future.

Retroplacental hæmorrhages and apparent, accidental bleedings are, in by far the most cases, a direct outcome of toxæmic states. Unfortunately, the improvement in incidence is not so marked here as in eclampsia, because so

many of the hæmorrhagic cases are mildly toxic cases, with few symptoms. This mild toxic state is usually prolonged and cumulative, and frequently overlooked unless it is carefully looked for. But, here again, with further instruction of the laity, and a closer watch by physicians and hospital staffs, it is a fair assumption that these slowly cumulative toxæmias will be recognized early and appropriate treatment applied. When this happens the results will be even more striking than has been the case in eclampsia. Why? Because these cumulative toxæmias respond more readily to treatment.

As regards sepsis, the forecast is a different one. Sepsis, since the introduction of the glove in obstetrical practice, has fallen very considerably, but it is still altogether too high. It has not appreciably fallen in the last few years. Last year, in the United States, 18,000 women died of puerperal sepsis. Now, this does not begin to tell the true state of affairs. Only too frequently the cause of death is put down as pneumonia or other incident in the puerperal septic state, so as to avoid any possible question about errors in technique. If all those who had died of complications of puerperal sepsis were added to the above, and if to this figure were added all those who died of septic abortion, the number would, undoubtedly, be vastly higher.

The only remedy for the prevention of sepsis in abortion lies in instruction of the laity and physician. The laity must be taught the frightful risks that accompany abortions, whether they are induced or spontaneous. The exceedingly high death rate accompanying induced abortion must be brought to the attention of the public. Fear of consequences will be the strongest deterrent. Spontaneous abortion also has its great dangers. Physicians should be made aware of the dangers incident to vaginal examination without proper technique, and the futility of and the dangers resulting from meddlesome and ill-timed intervention.

Sepsis in the puerperal state must be examined fairly and squarely. The lower mortality rate in the midwives' practice as compared with that of physicians', and the still greater difference when compared with hospital practice, argues for a new introduction into the case room by the physicians or by the hospital staffs (nurses and doctors). What is this new factor? Let us look at it squarely. A patient in the hands of a midwife is in the hands of one woman only. Relatives do not count because the patient is more or less immune to her surroundings. Let us put down the chances of infection from the nurse as 1 per cent. The patient attended by a physician-accoucheur is also attended by one person only,

(possibly with an attendant nurse); the incidence here is, also, we may say, 1 or 1½ per cent. Yet his infected cases more than double the midwife's cases. The cause must lie in the fact, not that the midwife is a better "waiter" during the first and second stages but that she is less likely to be a carrier of infection, in that she deals only with clean obstetrical cases and is not called upon to do minor septic surgery, or to attend contagious diseases and other practice dangerous to parturient women. If we now turn our attention to hospital practice, the chances of contamination are greatly increased by the larger number of nurses, the presence of a large surgical staff, and (in many cases) students. It has been demonstrated in most of the recent virulent outbreaks in hospitals that the cause was a "carrier" of the streptococcus, harbouring it in the throat or nose. Autogenous infections are frequent, but are seldom other than mildly morbid states and probably very seldom cause death.

Now what is the remedy? It is so simple on paper, but so difficult in practice. Only recently I went into the nursery of a large hospital. I was handed a gown and a mask. I put them on. The nurse who came in with me took no such precautions. When I called her attention to her sins of omission, she pulled a nose mask out of her pocket, after she had been stooping over the child. This is the personal element that has always to be reckoned with. It is safe to say that most nurses and doctors think that such technicalities are all right for others but unnecessary in their own cases. Yet it is just because the physicians and nurses are dangerous to obstetrical patients that we must adopt every means to protect the patients from these contacts. Some enlightened opinions, high up in the obstetrical world, hold that we ought to revert to the midwife as an easy means of remedy. This argument has to be met frankly and my answer applies only to Canada. Let other countries find their appropriate solution. We have committed ourselves for generations to the policy of physician-accoucheurs. We cannot turn back now even if we should wish to. Our policy has been an evolution, slow, and cumulative. The physician-accoucheur has come to stay. That is the positive answer. The negative side is that we have practically no midwives, nor have we a class of women who would be willing, in large numbers, to undertake this type of work. It would mean years of training to make them efficient. Lastly, our public (except those recent imports from the near East) are not favourably disposed to midwives, and the public have the say as to who may or may not attend them in labour. What an indictment of our training in obstetrics to admit that a midwife, with poor schooling and short medical training, is a more effective obstetrical agent than is a graduate in

medicine! No, the fault lies with our methods, and the earlier we recognize this and apply the remedy the sooner will obstetrics enjoy the immunity which it so highly deserves. Were men the parturients the writer ventures to state that we should have acted with greater celerity.

In short, it is our first duty to protect the patient against herself, and our second duty to protect her against others with whom she comes in contact during her puerperium. How can we perform the first? By establishing ante-natal observation depots, easy of access, and with frequent and convenient consulting hours; by staffing the observation depots with keen efficient men, and protecting the patients by every practicable means against contamination during these consultations; by providing a mother hospital to which patients can readily be sent for observation and treatment.

As to the second, I would advocate the complete separation of obstetrics from all other branches of medicine and surgery. In the medical wards the staff come so frequently into contact with contagious and infectious diseases that they easily become dangerous contaminators. The surgeons are even more dangerous, owing to the large number of septic cases under their care, and I would insist that gynæcology and obstetrics be separated as to buildings, resident staff, and nurses. Gynæcological surgery is in great part septic surgery. One has but to mention pelvic abscesses and incomplete abortions to bring this forcibly to mind. The latter type of case constitutes quite a large percentage of gynæcological surgery.

Community of resident medical and nursing staff in a gynæcological and obstetrical hospital will, I feel, in a very short time be a thing of the past. The nursing and medical staff should be examined carefully at intervals for septic throats, nasal infections, skin lesions, and such like infectious troubles. Cultural tests should be performed at regular intervals. (A difficulty arises here, in that bacteriologist cannot quickly tell when an organism is virulent or attenuated, but it would be erring on the safe side to eliminate even doubtful contacts.) It is the writer's opinion that the day of large wards, both for mothers and the infants, has gone, and that small subdivisions, and the smaller the better, are in order.

We must adopt every possible means of disseminating knowledge among the laity, as to personal hygiene, activity, diet, the early recognition of symptoms of significance, and sexual intercourse. The three last cases of virulent sepsis seen by the writer were attributable to intercourse just before the onset of labour. In two of these the membranes ruptured one and three hours, respectively, after intercourse.

We must recognize that obstetrics is a specialty, probably the most difficult specialty, requiring careful observation, vast experience, quick judgment, and more than ordinary skill. When we consider that after delivery the uterus is a large raw surface communicating with the external world, we are not surprised at its tremendous potentiality for disease, and one wrong step along a certain line of conduct does not often permit a retraction.

For us the remedy is not midwives, but better trained obstetricians. The day is gone when the budding practitioner can look upon obstetrics merely as a bread winner until he can dispense with this means of livelihood. And the means for greater education of the physician lies in two directions. Firstly, facilities for post-graduate study or observation must be provided. Lectures by prominent men, given regularly, should be made so attractive that they would be eagerly attended. Secondly, more practical teaching and ward work for the student. The tendency of to-day is to magnify medicine and surgery at the expense of obstetrics. Medicine will eventually be transformed into preventive medicine and immunology, and surgery,—well as "Lens" states it, unless birth control becomes universally applied and effective, and unless maternal instincts die, obstetrics will still be a science and an art when surgery will be an emergency.

Lastly, the resident staff of maternity hospitals should be encouraged by salary and other inducements to remain for several years at the work. This would lead to more efficient service and more highly trained men. The reason for this is obvious. The consulting staff cannot be at the maternity hospital for all deliveries. That would be impossible, and yet the simplest case may turn out to be a most difficult one. This I have seen many times, and when emergencies arise they arise with surprising suddenness and have to be met promptly. There is only the senior resident to call upon under these circumstances. He ordinarily is a man of only a limited experience, also, and the patient will be fortunate if a visiting staff member should happen to be in the hospital.

Obstetricians will not have done their duty to their patients and their specialty until patients can be told with a degree of assurance that their reserve is such that pregnancy and parturition can be undertaken without undue risk. Motherhood deserves this assurance. Yet we are far from that goal, and we are not striving with all our strength to cover the distance.

Men and Books

A SHORT HISTORY OF MEDICINE*

A Review of Dr. Singer's Book

By MAUDE E. ABBOTT, M.D.,

Montreal

This little volume presents an appeal to a wider public than the strictly professional one, for, as the preface states, it seeks to place before the reader without special knowledge an intelligible account of the evolution of scientific medicine from its origin in the civilizations of antiquity to the present time. The book constitutes something of a new departure both in this, and also in its general plan, which has been to trace the principles or philosophy of medicine rather than its practice, and the gradual development of these from small beginnings to the mighty stream of special knowledge that flow into the ever-widening gulf of what we know as modern medicine to-day. The author's conception is, following Aristotle, "and after him the goodly company of Harvey, Hunter and Virchow, of Claude Bernard and Johannes Müller", that there exists an indwelling purposiveness ("Entelechy", or soul) in living things, which above all else claims our interest and consideration, and that some knowledge of this may perhaps be gained "from the view point at which the stony tracks of the separate sciences converge." Rational medicine, as here considered, involves many and perhaps all the sciences, and it is the story of these scientific elements that is told, rather than that of the individual masters of medicine through whose powers of intellect the secrets of nature have been unveiled. For this reason the biographical side is largely in abeyance, and only those names are mentioned which are believed by the author to typify or represent the various movements or actual discoveries by which scientific advance has proceeded. The book is thus essentially a history of ideas, and as such it supplies a fascinating story, which gains coherence and lucidity from the clarity of its arrangement and its masterly simplicity of style. These features, as well as its conciseness and compact form, qualify it for use as an elementary handbook on the History of Medicine, and as such it will surely go far to popularize our knowledge of the splendid heights attained by medicine in modern times, and the gradual evolution of these

through the application to the facts of nature of the sublimest faculties of human intelligence.

The book is divided into six parts or periods, of which the first five, dealing with Ancient Greek medicine and that of the Middle Ages, the scientific awakening of the sixteenth and seventeenth centuries, and the "Period of Consolidation" from about 1700 to about 1825, are compressed into its first half, while the remainder of the volume is given up, under the title "The Period of Scientific Subdivision from about 1825 on," to modern medicine in its multitude of specializations. One of the finest parts of the work, from the literary and educational standpoint lies, in our judgment, in its opening chapters, under the captions "Ancient Greece" and "Heirs of Greece". This is Singer's own field, and here the origins of Greek scientific medicine, from roots struck deep in the submerged Minoan civilization and the adjoining Egyptian and Mesopotamian cultures and obscure contacts with "the brooding spirit of savage man," are yet advanced from animism by that "sweet reasonableness" of mind that made this extraordinary people the true progenitors of all scientific thought on earth. The remarkably modern features of the Hippocratic "Collections" and "Practice"; the biological revelations bequeathed, together with certain physiological errors, by the great Aristotle to posterity; the theories of the Alexandrian School; the contributions of the Roman Medical Services in sanitation and army hospital organization; and, finally the "Medical Synthesis of Antiquity", as obtained from an analysis of the Galenic writings; all these are delineated with a sharpness of outline and a discerning acumen that goes far to dispel the mental confusion which the mistaken theories of antiquity have tended to instil into the story of the infancy of medicine.

Another extremely interesting feature in this first half of the book is the selection which the author has made of those whose names are to be associated with the various great advances made in the three momentous centuries that immediately precede the modern period. For the scientific activities of many of these lies without and beyond the field of medicine proper, and illustrates well his theorem that "Medicine is a rational discipline involving many and perhaps all the sciences". Thus, under Part IV, "The Rebirth of Science" (1500-1700 A.D.), we read that Leonardo da Vinci was the first to question the views of Galen, and that he, with the other great artists of his day, may be said to have ushered in the "Anatomical Awakening" of which Vesalius is the acknowledged prophet and high priest and Ambroise Paré the

* A Short History of Medicine. Introducing Medical Principles to Students and Non-medical Readers. By Charles Singer, M.D., D.Litt., F.R.C.P. Pp. 368. Price, \$2.50. Oxford: The Clarendon Press; London: Humphrey Milford, Oxford University Press, 1928.

surgical disciple. Again, in the "Renaissance of Internal Medicine", a little later in this same period, not only was the epidemiological work of the physicians Fracastoro, Baillou, and the great Sydenham (1624-89) of prime importance, but less directly, yet equally fundamental, were the observations of the physicists Giordano Bruno (1548-1600), William Gilbert, Tycho Brahe, Galileo (1564-1642), Johannes Kepler (1571-1630) and Borelli (1608-1670), of the philosopher Descartes (1596-1650) and of the chemists Robert Boyle (1627-1691), Jacobus Sylvius, Mayou and Stahl. So also, the revival of physiology of this era, which culminated in Harvey's great discovery upon which the whole superstructure of modern medicine is reared, was based on Galileo's "Veritable charter of science" and the pioneer work of Sanctorius, who first applied the latter's principle of exact measurement to biological matters, as well as on the observations of the anatomist Fabricius ab Aquapendente and the subsequent labours of the microscopists Malpighi, Leeuwenhoek, and Swammerdam. Again, his "Period of Consolidation" of the mass of accumulated observations of the last two centuries was ushered in by Sir Isaac Newton's (1642-1727) enunciation of the law of gravitation, which, linked by him with the theories of Galileo and with Kepler's laws of planetary motion, revealed the mechanism of the universe, and established our knowledge of the "Reign of Law" under which scientific medicine has risen to such prodigious heights to-day. The dawn of modern physiology dates from the work of Albrecht von Haller (1708-1777) the great pupil of the clinical teacher Hermann Boerhaave, but here again notable advances were made by the Rev. Stephen Hales (1677-1761), mathematician and biologist, who investigated the dynamics of the circulation; by the French naturalist, de Reaumur (1683-1757); the Italian Abbate Spallanzani (1729-1799), the English physician William Prout (1785-1850), and the American army-surgeon William Beaumont (1785-1853), on the physiology of digestion; by the physicists Galvani (1737-1798), and Volta (1745-1827), who established the electrical reactions of nerve and muscle tissue; by the chemists Joseph Black (1728-1799), Cavendish (1731-1810), and the English Unitarian divine Joseph Priestley (1733-1804); in the re-discovery of the composition of the air, and the application of this knowledge to the processes of respiration and metabolism by the brilliant French chemist Lavoisier (1743-1794).

Again, during this observational period, morbid anatomy sprang into a science through the publication in 1761 of the classic treatise of Morgagni, for fifty-eight years a professor at Padua, whose efforts were seconded by Matthew Baillie, the Scot, (1761-1823), and brought to completion by the work of Karl Rokitansky of

Vienna. Physical diagnosis came into its own through the discoveries of the Viennese doctor Auenbrugger (1722-1809), and the Breton physician Laennec (1781-1826). Obstetrics was established as an art by William Hunter (1718-1783), and surgery as a science by his still more brilliant brother John (1729-1793). The beginnings of the science of vital statistics were laid by the English physician Sir William Petty (1623-1687), known as the "Father of Political Economy", the astronomer Edmund Halley, the French Huguenot Abraham de Moivre, the Prussian clergyman J. P. Grisswild, and the Belgian astronomer Lambert Quetelet. Military and naval medicine took form under the hand of the Scotchmen Sir John Pringle, a pupil of Boerhaave (1707-1782), and James Lind (1716-1794), the explorer Captain Cook (1728-1779), and the Manchester health reformer Thomas Percival (1740-1804), while the humanitarian movements of prison and hospital reform found early exponents in the philanthropists John Howard (1726-1790), and Elizabeth Fry (1706-1790) in England, and, in America, in the statesman Benjamin Franklin and the great Philadelphia physician Benjamin Rush. In the control of epidemic diseases, inoculation against smallpox, introduced into England by Lady Mary Wortley Montagu (1689-1762) and endorsed there by the learned Dr. Richard Mead (1673-1754), was supported in America by the Puritan leaders Increase and Cotton Mather; the discovery of vaccination by Edward Jenner (1749-1823) opened the way to the new study of immunity; and Pierre Bretonneau of Tours did pioneer work in the differentiation of diphtheria and scarlet fever and the recognition of typhoid.

So diverse were the sources and so universal the science that fed the great stream of rational medicine in this age of inductive reasoning that preceded and underlay the modern "Period of Scientific Subdivision of Medicine from 1825 A.D.," which occupies the last and most important part of the book. Here we are astonished to realize how entirely the accomplishments of that earlier age of discovery have slipped into the background in the development out of them of the new ideas which are to-day to us a commonplace, but which have completely transformed the face and the outlook of the medical science of our time. The revolution in preventive medicine, and its entrance into legislation, both national and international, which was in its origin essentially an English movement, is a product of the last one hundred years. So also the experimental foundations of modern medicine were laid less than one hundred years ago by the great physiologists Johannes Müller (1801-1858), Claude Bernard (1813-1878), and Karl Ludwig (1816-1895). The knowledge of the cell-structure of the tissues, first perceived

by Bichât (1771-1802), and amplified by the observations of the botanist Schleiden (1804-1881), Schwann (1810-1882), and v. Nägeli, and by Max Schultze, successor of Helmholtz as Professor of Anatomy at Bonn (1825-1874), became the basis of an independent science through the publication by von Kölliker of the first text-book on histology (1850-1862). The magnificent achievement of Virchow, as set forth in his "Cellular Pathology", published in 1858, together with the conceptions of Metschnikoff (1845-1916) and Almroth Wright, created the sciences of cytology and cytopathology, of which a major development is the modern field of investigation known as "Cancer Research". The establishment of the germ theory of disease by Pasteur and Koch and their followers; the discovery of ether and chloroform anæsthesia; the understanding of the nature of inflammation and infection, and the application of this and of the principles of asepsis in the domain of surgery by Sir Joseph Lister; the triumphs of the study of immunity in the prophylaxis of various deadly infections; the conquest of the tropics through the understanding of the life history of the organisms of yellow fever and malaria, the changed view on insanity, the revolution in nursing, the tremendous advances in our knowledge of the pharmacological action of drugs and of disorders of the internal secretions and metabolic processes in general,—all these are dramatic chapters, unfolding in rapid succession a view of the magnificent achievements of scientific medicine in the present, and the immediate past. The end however is not yet in sight, nor can it be divined. The book ends on a note of warning against "the jubilant terms of victory", or a too optimistic attitude. The diffusion of interests induced by the increased specialization of to-day cannot go on for ever without defeating the very objects for which specialism was initiated. Mere accumulation of data is not an end, but only a means to an end, for correlation is essential and real advancement in knowledge can only be tested by effective advances in theory. There are whole departments of medicine in which no progress has as yet been made, and many of the higher topics of disease, such as its mode of entrance or onset in man, and why human resistance and the virulence of specific organisms vary in different seasons and localities, and a thousand

like problems, still remain to us entirely unknown ground. Moreover, the concentration of "Endowments of Learning" at the present day upon the scientific departments, especially of the applied sciences, gives rise to a subtle yet very actual danger. Those who have the true advancement of medical science at heart should encourage the pursuit, not alone of this but of learning as a whole; for "Science is a way of life that may penetrate into all departments", and only in the light of the broader culture may the consummation of knowledge in any subject be attained."

In conclusion, one small comment suggests itself in the perusal of this most delightful book. Among the skilfully selected galaxy of great names, incidentally cited as having taken an essential or leading part in the forward movements of the period of scientific reawakening and consolidation, we miss those of Servetus, Caesalpinus, Commodus, said to be the discoverers of the pulmonary circulation, of Antonio Benevieni the first descriptive pathologist, and of Skoda, who would seem to us to have rendered as great a service in physical diagnosis in bringing the discoveries of Auenbrugger and Laennec to final fruition as did Rokitsansky in the field of pathology. These omissions are probably not unintentional with the author, but are based by him on historical grounds, as in the case of Osler, whose name is also omitted from the later part of the book, for reasons explained in the preface. In the latter case, however, we venture the opinion that, as Boerhaave brought the clinical impetus from Padua to Leyden and there made it the foundation of systematic bedside teaching, so Osler, bringing these methods from McGill, an off-shoot of Leyden through the Edinburgh school, to the medical teaching centres of the United States, was himself responsible not only for the introduction and extension of clinical teaching methods in that country, but also for that tremendous impulse towards clinical scientific research which constitutes the heart of what is known to-day as the Renaissance of American Medicine, and that for this reason he deserves mention here.

The book is enriched with many illustrations of great historical value which add much to its elucidation and importance.

STREPTOCOCCAL CARRIERS AND SCARLET FEVER.—E. A. Lane and Edith A. Becker, from comparative observations on children attending schools in districts where scarlet fever had been prevalent and children with no such history of exposure, came to the conclusion that there was no justification for regarding the presence of hæmolytic streptococci in throat swabs as a reason for exclusion from school. Hæmolytic streptococci were found to be fairly common among all groups of children,

and of quite uniform prevalence in the months of February and March, when the experiments were made. According to the authors, until a sufficiently precise technique is available to identify the scarlet fever organism, and be sufficiently simple for general application, the control of scarlet fever must continue without the aid of throat cultures.—*New England Journ. Med.*, p. 1253, June 20, 1929.

Hospital Service Department Notes

AN INTERESTING SUGGESTION

A recent issue of *The Canadian Hospital* published an address on "Hospital Problems in Cities and Large Towns,"* which had been broadcast a short time previously from one of our Canadian radio stations. Written by two well known hospital authorities, this article suggests, as one remedy for the cost of sickness, the application of the principles of co-operation by our hospitals. Co-operative purchasing and the development of diagnostic centres are urged. The following paragraphs are of interest as reflecting an opinion that is becoming more and more the viewpoint of the general public, of which fact we in the medical profession should be kept cognizant:

"There is no doubt that a considerable part of the present high cost of sick care can be attributed to duplication of effort and facilities. Take any city or town in Canada with more than one hospital, why should there not be more co-operative buying of everything used in the hospitals? Of course, if the matter is left to hospital officials, hospital boards, and hospital doctors, the development will naturally and inevitably be towards more individual units, and that means more individual purchases, duplicated services, and higher administration costs. If the public, who pay the price, either in direct personal hospital bills or in increased municipal and government contributions, want to buy more health service for a dollar, they can get it just the same as they can benefit from large-scale co-operation in buying and selling in other enterprises.

"In our largest cities, we may expect to see the development of large medical health or diagnostic centres that will become the workshops of medical authorities inspired with the will to keep people well rather than to take care of the actually sick. In some of our cities,—where hospitals of all kinds have already been developed extensively, the creation of a unified health centre will become increasingly difficult, unless the public makes emphatic demand for the benefits that would accrue.

"There would be tremendous gains from central heating, centralized garage and aeroplane parking facilities, co-operative purchasing benefits, scientific consultation and technical services, avoidance of unnecessary duplication of equipment and effort, joint research facilities, etc."

These suggestions for future development are now being put to practical test in various American centres, an experiment which is being watched here with considerable interest. Without doubt, some measure of co-operative purchasing, as developed by our "chain-stores" might be considered by our hospitals. Already it has proved most successful among the Red Cross hospitals. The Montreal Hospital Council is enthusiastically supported by all its members. We cannot scrap all our present urban hospital development, and there are many reasons why individual hospitals supported by various groups of public spirited citizens or organizations should be supported, but the principle of closer co-operation of existing units is fundamentally sound and should be encouraged.

HARVEY AGNEW

*GOVAN, J., and PARRY, B. E. "Hospital Problems in Cities and Large Towns," *The Canadian Hospital*, June, 1929.

CUSTOMS TARIFF AND THE HOSPITAL

Many hospitals in various parts of Canada have complained bitterly about the payment of heavy customs duties upon articles used solely in institutions for the care of the sick. Heavy duties are charged upon such articles as electrical breast pumps (27½ per cent), Diack controls for sterilization (25 per cent), ether (25 per cent), operating room lights (30 per cent), signal systems (27½ per cent). Bedpan washers are considered as washing machines and pay the usual rate, despite the fact that they are never used outside of a hospital.

One appreciates the fact that some protection is necessary to save the market for Canadian manufacturers. However, the duties which the hospitals desire to have removed are on those articles which are *not* made in Canada. The hospital field is so small, relatively speaking, that it does not pay a Canadian or foreign manufacturer to produce these articles here. Therefore, these duties are actually *revenue* duties and constitute a source of revenue which is of very doubtful justification, considering that the ultimate cost is borne by the patient at a time when he can least afford it.

There are a number of details in the present Act which were not anticipated by its revisers. For instance, impregnated x-ray catheters, which are on the free list, are actually cheaper to the hospital than are the ordinary web cystoscopic catheters which are dutiable. Metal male catheters are free, but silk or gum elastic catheters are dutiable. A splint of wood or moulded fibre is dutiable, despite the fact that its aluminum replica is free. Pedestal operating lights come cheaper if a diagnostic tube is put on them; hæmocytometers are free in a metal case and dutiable in a leather one. Water stills are dutiable unless they are destined for the physiological department. Catgut is not manufactured in Canada; § 687 states that unmanufactured catgut comes in free, and yet hospitals importing raw catgut in coils, with the fat still unextracted and considerable preparation yet to be made, are charged duty. Many hospital items are not mentioned and the interpretation of classification is said to vary considerably at various ports of entry.

Many other articles, such as examining tables, food mixers, dish-washers, methyl alcohol, washing machines, and other equipment, which may be used elsewhere than in hospitals, should be admitted free of duty, if their importation *for hospital use only* can be assured. We realize that this provision might be subject to abuse; but adequate safeguards could be provided.

A number of provincial hospital associations

have requested that these tariff regulations be revised. The total loss of revenue to the Government from such revision would not be great and yet the individual saving to each struggling hospital would be sufficient to permit the purchase of certain much needed equipment. One large western hospital recently paid ninety-six dollars duty on Diack controls alone. Is it any wonder that the majority of hospitals dispense with any accurate check on their sterilization technique?

It is realized that the policy of the govern-

ment is to facilitate the use of equipment essential to life and health, and certain items such as x-ray machines, microscopes, and metal surgical instruments are now on the free list. However, the present regulations, as they apply to hospitals, are greatly in need of revision. The doctors of Canada can perform a real service to their local and all other hospitals if they will undertake to speak to their federal representatives about the desirability of modifying these impositions.

HARVEY AGNEW

Medical Societies

THE ONTARIO MEDICAL ASSOCIATION

ANNUAL MEETING, DISTRICT NUMBER SIX

The annual meeting of District Number Six of the Ontario Medical Association was held in the Ontario Hospital, Cobourg, on Thursday, September 5, 1929, with an attendance of about eighty members of the profession from the surrounding counties. Commencing at two o'clock in the afternoon, a very excellent program was presented, in which the following took part:—

Dr. W. C. Herriman, Cobourg, "Points in regard to admission of patients to Ontario Hospitals."

Dr. Geo. H. Stevenson, Whitby, "Diagnosis in mental diseases."

Dr. I. M. Rabinowitch, Montreal, "Diagnosis and treatment of thyroid diseases for the general practitioner."

Dr. A. P. Hart, Toronto, "Infant feeding."

A very enjoyable banquet was arranged by the local hosts, a large number of ladies being present. Vocal solos were contributed by Dr. J. C. Smith of Lakefield and Dr. F. P. Lloyd of Cobourg. Greetings were extended to the visitors by Mayor McCartney of Cobourg.

Immediately following the dinner, Mr. H. W. MacDonnell, of the Industrial Relations Department of the Canadian Manufacturers Association, Toronto, gave an address on "State insurance." This was very much appreciated by all who heard it, inasmuch as the subject was very ably dealt with from the standpoint of the layman. Dr. John Ferguson, President of the Ontario Medical Association, then gave a talk, dealing with the same subject from the standpoint of the medical practitioner. Dr. T. C. Routley, Secretary of the Ontario Medical Association, gave a brief talk on matters of interest in regard to organized medicine. This was followed by a most interesting and enjoyable talk by Dr. L. J. Austin, of Kingston, on "The Kings of France."

During the afternoon, the visiting ladies

were entertained at bridge and afternoon tea at the Golf Club, where a very delightful time was spent prior to assembling at the banquet.

A brief business session was held at which Dr. F. C. Neal of Peterborough was re-nominated as Counsellor and Dr. Geo. H. Stobie of Belleville was elected Vice-Counsellor for the ensuing year. It was also agreed that the annual meeting of the District for 1930 should be held in Peterborough.

ANNUAL MEETING, DISTRICT NUMBER NINE

District number nine of the Ontario Medical Association met in annual conference at North Bay, on September 9th, delegates being present from all parts of the district, some of whom motored more than five hundred miles to attend.

During the morning session, held in the Masonic Temple, excellent addresses were delivered by the following speakers: Dr. H. B. VanWyck, Toronto, "Uterine hæmorrhage;" Dr. Geo. H. Murphy, Halifax, "The chronic appendix;" Dr. Gordon E. Richards, Toronto, "The x-ray investigation of the urinary tract."

At 1.30 p.m., the group sat down to luncheon at the Golf Club, following which brief addresses were delivered by Dr. Ross Millar, representing the Department of Health of Canada, and Dr. T. C. Routley, Secretary of the Ontario Medical Association. The balance of the afternoon was given over to golf, most of the men taking part.

At seven o'clock, an excellent dinner was served in the Empire Hotel, with an attendance of approximately thirty.

The evening addresses were as follows: Dr. John Ferguson, Toronto, President of the Ontario Medical Association, "Matters of interest to the medical profession;" Dr. A. T. Bazin, Montreal, President of the Canadian Medical Association, "The pitfalls of practice;"

Dr. Geo. S. Young, Toronto, "Hypertension."

Dr. T. C. Routley outlined the new plan being put into effect for periodic physical examinations. This was followed by the showing of an excellent film on physical examinations, which

has been prepared expressly for the Canadian Medical Association.

The conference was very ably presided over by the District Counsellor, Dr. W. J. Cook, of Sudbury.

University Notes

University College, London, 1826 to 1926

A very interesting and appreciative story of the gradual development of University College, London, into the greater institution of the University of London, appears in the *Lancet* of July 20, 1929, as a review of a recent volume by H. Hale Bellot of the University of Manchester, from which we quote.

Sir Thomas Gresham's foundation in the middle of the sixteenth century introduced the idea of a University of London 200 years before the inception of the present University, but from one cause or another it had never borne fruit. It was not until the year 1820 that a real beginning was made, when Thomas Campbell, the brilliant erratic poet, went to Bonn, and there was struck by the mutual tolerance in University circles of protestants and catholics and by the liberal treatment accorded to the Jews; at once the desire for a University for London arose in his mind, which should admit to its privileges and opportunities all who wished to learn without distinction of creed. There can be no doubt that it was Campbell's promulgation of this sentiment that led ultimately to the establishment of the University of London. The older universities had done much splendid work and were doing it; they had changed also in response to the changes in the life and thought of the country, but the work they were doing, excellent though it was, did not fulfil all the needs of the time. The enormous advances in physical science, the changes in many branches of exact knowledge, and the development of new classes in society whose interests differed in many ways from those of the dominating sections of the previous century—all these things had led to a widespread feeling that there was room for drastic alteration in the mode of training those who had to take part in the business of life in every field of activity. Science was not receiving the place in education which its ever-increasing importance in manufactures demanded. But—and it was, of course, the fact of prime importance—in the older universities even that measure of science which was taught, and which was capable of practical application, was not available to that large portion of the population which did not belong to the Established

Church. In this respect there were, indeed, slight differences between the attitude of Oxford and Cambridge, but at neither University could a degree be obtained by any non-conformist. Thus there was a large body of all denominations anxious to have systematic teaching in many branches of modern learning who were unable, in this country, to get any university training at all. It was not that in Great Britain there was any lack of modern thought; in Scotland especially much had been done during the latter half of the eighteenth century to advance the cause of modern learning; but the fact remained that the whole country was not benefiting as it should have done from the accumulating stores of knowledge, and this at a time of great material development.

Exactly at this place a great factor in the demand for a modern university in London was furnished by the position of medical education. It was seen to be unreasonable that a London student of medicine should be unable to obtain a degree in London, but be forced to go to Oxford or Cambridge, or to proceed to other divisions of the Kingdom or abroad. Moreover, though there was an enormous amount of clinical instruction available in London, all the systematic teaching was on the whole ill-organized; for the large number of medical students in London the need for a regular and complete course of medical teaching in London was urgent, and this made obvious the great desirability of the establishment of a university medical faculty in the metropolis. To Campbell must be given the credit of bringing to a head the recognition of this need; the original idea was his and credit is often given to others which, in part at least, belonged to him. But a large number of progressive and highly educated men resident in London soon came to take part in the attempt to form a metropolitan university and Campbell was soon joined by, among others, Brougham, Bentham, Grote, Mill, Tooke, Macaulay, Birkbeck, and Goldsmid, who may be taken as typical of those who shared in the work. Ultimately it was resolved to start a joint stock company, and under a deed of settlement it was arranged to raise a capital of not less than £150,000. Sufficient money was received, not without delays and disappointments, to justify

the laying of the foundation-stone of University College under the title "London University," and this was done on April 30, 1927.

Then came the task of appointing the professors. The new Council of the College wished to choose men of high standing, but the fact that the emoluments of the professors had to depend mainly on the fees of the students, while the students had not yet materialized, limited the number of applicants, and many difficulties arose. Of the professors appointed some in nearly every department resigned after a short tenure of office, and the lack of sufficient capital increased greatly the responsibilities of the Council. Of all the departments during the first few years of the life of University College, the most successful by far was that of medicine. In the first session there were 183 medical students, in 1831 there were 252, and in 1834 the number had risen to 390, when the success of the new institution led naturally to imitation by other metropolitan medical schools and the rate of increase fell off. At first the medical students of University College had to seek their clinical knowledge where they could obtain it, but University College Hospital was opened in 1834, and this disability was removed. But Mr. Hale Bellot brings out clearly in his book the anxious time which the College had before it for many years. The establishment of King's College, London, detached many who would otherwise have been students. The Law Society and the Inns of Court established courses of lectures on the various branches of legal study, and this reduced the number of legal students, and the need of a charter to give power to confer degrees was a serious drawback. It was exactly this proposal on the part of the Council that was the cause of the greatest opposition; this came particularly from Oxford and Cambridge and the Royal College of Surgeons of England, and it seems, from physicians and surgeons of the medical schools of London other than the school of University College Hospital. But towards the latter half of 1836 the Government of the day took a hand. Two charters were drafted, by one of which the body hitherto called London University was incorporated as University College, London, while by the other charter an entirely new body was created, to be styled the University of London with the full powers of a university. Thus the long struggle was ended in what was probably the best settlement, despite subsequent history.

It is certain that the stimulating influence of the work done in a University College had an enormous effect on many other teaching bodies in London and elsewhere; it showed them the need that existed for a wide change in the methods of instruction. At first in this way the College warred against its own interests.

The excellent example which it set led to a diminution of the number of its students, who went to other educational bodies, which were now granting increased facilities. It was not until the sixties that the fortunes of the College were placed upon a firm basis, but by that time it had become generally recognized that it had achieved and was achieving famous deeds in enlarging the sphere of learning, in removing obstacles which hindered the entry of promising students, and in turning out graduates fit to hold great national positions. Since that time the progress has been continuous. In many departments of learning the College has been a leader, and from its walls many professors have gone out as missionaries of learning to other seats of education. During the hundred years that have passed since its foundation it has done, perhaps, more than its famous founders expected, while it is entering on its second century stronger than it has ever been.

University of Glasgow

Retirement of Sir Donald MacAlister

The announcement that Sir Donald MacAlister, Bt., M.D., had decided to retire from the positions of Principal and Vice-Chancellor of Glasgow University was briefly mentioned in the *British Medical Journal* of August 3rd (p. 228). The Principal is one of the most distinguished Scotsmen of the time, and has been honoured by many of the important universities of the world. His academic career is an unbroken record of brilliant achievement. He was born at Perth in 1854, and is the son of the late Mr. Donald MacAlister, formerly of Tabert, Loch Fyne, Argyllshire. Having received his early education at Aberdeen, he went to Liverpool before entering St. John's College, Cambridge, and in those early days were developed gifts of mind and character which were to carry him to eminence. Senior Wrangler and First Smith's Prizeman at Cambridge, he was elected a Fellow of his College, and afterwards became tutor and director of medical studies there. Later he was Lecturer in Natural Philosophy at St. Bartholomew's Hospital, London, and in 1899 he became Thomson Lecturer at Aberdeen. For many years he represented Cambridge on the General Medical Council, and in 1905 he succeeded Sir William Turner of Edinburgh in the presidency of that body. His appointment to the Principalship at Glasgow University in 1907 broke the line of divinity principals. He succeeded the Very Rev. Principal Story. Combined with his eminence in arts and science, and his deep and varied scholarship, Sir Donald MacAlister has great business aptitude and capacity for organization. His tenure of high office at

Gilmorehill will be memorable, probably historic. He saw the foundation of many new chairs and lectureships, among them being the chairs of obstetrics and gynaecology, surgery, medicine, and pathology, at Glasgow Royal Infirmary; and at the University the chairs of Scottish history and literature, French, German, bacteriology, organic chemistry, mercantile law,

and applied physics. Sir Donald MacAlister has a long list of publications to his name, including a translation of *Ziegler's Pathological Anatomy*. A master of tongues, he speaks no fewer than fourteen languages with fluency. The appointment of a successor to the Principalship will be made by the Crown authorities.—*Brit. M. J.* 2: 273, Aug. 10, 1929.

Special Correspondence

The London Letter

(From our own correspondent)

For some reason or other August appears to be an important month for the production of statistics in a somewhat wholesale manner, and official publications have recently been showered upon the press. It has been said that statistics are like sausages; it all depends on whether you know the old woman who makes them. Fortunately, the makers of most of the recent important statistics have unshakeable reputations, and, indeed, with Professor Major Greenwood in the chair of vital statistics in London University it behoves all public officials to take great care with their wares. Sir George Newman's report "On the State of the Public Health" indicates that we are approaching a stationary population, with the birth rate down and the death rate down, and the preponderance of older people among the population will probably mean that an increase in the mortality rates of such diseases as cancer will show itself in the next few years. On the other hand the infantile mortality rate is down to the lowest figure for this country, 65 per thousand births. While congratulating ourselves on this, we are still ashamed of our maternal mortality figures which are the highest on record and as has been indicated in these notes the public health authorities and the medical profession are considerably alarmed at the position. Sickness apart from mortality took its usual tremendous toll during the year and more than fifteen and one-half million pounds had to be paid out by the Approved Insurance Societies in sickness and disablement benefits. Another report of great interest was Dame Janet Campbell's part of the international inquiry into infant mortality for which she has conducted the English section. It is strongly urged in this report that there must be extension of the present facilities for home nursing, so that skilled nurses can attend all sick babies in their homes, and it is also suggested that the most satisfactory way of ensuring timely medical attention for babies would be by an extension of the National Health Insurance Acts to the dependents of

insured persons. A third report of some interest was concerned with a twenty-five years' study of scarlet fever, diphtheria, and typhoid fever by the same clinical observer, Dr. E. W. Goodall, in one of London's largest fever hospitals. Scarlet fever has changed its characteristics in a very remarkable way during this period, which dated from 1895 to 1914, and there has been so far no indication that it is reverting to its original type. Nowadays it is a relatively mild disorder, with a mortality rate of less than a third of what it was in 1895 for children of less than five years of age, and the most serious complications show a similar striking decrease. A fourth report deserves mention, if only as a warning on the interpretation of figures. This is the report of the medical officer of health for the city of London. A foreigner might well rub his eyes when he reads that only 82 children were born in the City of London during 1928. This is because, of course, the square mile which comprises the area of the City is given up for the greater part to business premises and it has only the resident population of a small country town.

Professor Wagner Jauregg, of Vienna, who suggested the use of malaria protozoa for the treatment of general paralysis of the insane as far back as 1887, was only able to report the first definite successes of his work in 1917, and by 1922 the method was adopted as an experiment in certain asylums in this country. The Board of Control, who look after the interests of all the lunatics here, urged the superintendents of institutions to try the method, and now Surgeon-Rear-Admiral Meagher has collected the results of malarial treatment and published them in a special report (*H. M. Stationery Office 1929. Price 2s.*) For comparative purposes he followed up over 600 cases of general paralysis in institutions in 1923, and, by 1927, 90 per cent of these were dead, 8 per cent were still detained, and only 2 per cent were living at home. Of the 152 cases of the disease treated by malarial therapy in 1923, 53 per cent were living in 1927, and, taking the whole group of 1,500 cases which have received this treatment, 321 are now able to follow some

sort of employment. These figures have been recorded and analyzed with the greatest care, and personal visits to many of the discharged patients have been made, so that it is really possible to say that malaria offers a most excellent chance of considerable improvement to a large proportion of general paralytic cases.

The death of Ray Lankester, the greatest of Huxley's pupils, last month deprived the scientific world of one of its most energetic and stimulating figures at the age of 82. He was the son of a medical man, and although he began what was almost the preliminary training for a medical career at Oxford he chose to follow Huxley's advice and study biology untrammelled by its direct application to medicine. At the age of twenty-seven he was appointed Professor of Zoology at University College, London, and here and elsewhere he had considerable influence on the careers of many medical students. Had he entered the profession he would undoubtedly have risen to a high position, although from his boisterous temperament one hesitates to think of him dealing with out-patients, for example. His writings for the public are universally read and are unequalled for their clarity of style and breadth of interest. He will be greatly missed.

ALAN MONCRIEFF.

London, September, 1929.

The Edinburgh Letter

(From our own correspondent)

Edinburgh's death rate during 1928 was 13.7 per 1,000 of the population. The infantile mortality for the same period was 75 per 1,000 births—the lowest ever recorded in the city. While these figures may be regarded as satisfactory, the birth rate of 17.3 per 1,000 is also the lowest that has ever prevailed in the city, with the exception of the war years 1917 and 1918. In 1861 the figure was 33.4.

Dr. William Robertson, F.R.C.P., commenting on these figures in his annual report, draws attention to the maternity and child-welfare departments, in supervising expectant and nursing mothers and in preserving the lives of the young. The appointment of four whole-time assistants in connection with the maternity and child welfare services has already proved its wisdom.

Under tuberculosis there were fewer notifications than ever before, while the number of those dying from pulmonary tuberculosis was the lowest that has ever been recorded. In twenty-eight years there has been a fall of more than 50 per cent in the deaths from this malady. The figures for non-pulmonary tuberculosis are even more satisfactory. In 1900 there were 270 deaths from this disease, this number has now

declined to 103 in spite of the population having greatly increased. No doubt when the slums are still further cleared and better facilities are provided for obtaining fresh air, this number will go down still further.

Only eight deaths were caused by scarlet fever during the past year. The lowest death rate recorded in the city since 1912 applied to diphtheria.

In his report on venereal disease, Mr. David Lees, F.R.C.S., shows how well his department is managing to cope with this difficult social problem. He agrees with other administrative officers that some form of compulsion is urgently required, to deal adequately with those, who, through indifference or ignorance, positively refuse to complete their cure.

Dr. Robertson remarks on the great improvement in health which has been demonstrated among persons removed from the overcrowded homes of condemned slum areas to the fresh surroundings of the various municipal housing schemes which have been erected since the war. All this is very reassuring, especially when a comparison is drawn between the conditions of to-day and those which pertained sixty years ago. The dwellings in the congested areas were, at that time, without water supplies and were still dependent upon public wells. A deplorable description of the homes of the poor was given by an Edinburgh journalist in 1867, who stated that "much less is known of the closes of Edinburgh than of many parts of the interior of Africa," and that "the internal arrangements of the Red Indian's wigwam are much more familiar to the Christian public than is the condition of the hovels in which many of our town's people live." Closes, stairs, passages and houses are described as being in a shocking state, and accumulations of filth, ashes, etc., are said to have been found under beds, behind doors, and in corners of rooms, but in several cases a desire to be clean and tidy is given expression to by the evidence of white-washed fireplaces. Some houses are described as being devoid of windows, and in others the doors are panelled with glass to borrow light. One house is described as a "miserable den." "The furniture consists of a small table, a teapot, a few pieces of crockery, a stone by the fireplace—the only 'chair or stool' to sit upon; a few rags lying on the causewayed floor in the corner—the only bed in the place; while an open channel crosses the floor draining water from an undiscovered source." From the structure of the apartment the journalist concludes that the place must have been at one time a cowshed, but not being sufficiently lighted and ventilated for cattle, had been let for a dwelling house; and, visualizing the economic problem facing the advent of the sanitarian, asks what is the use of a regulation for washing and sweeping of

POISONING FROM METHYL CHLORIDE USED IN DOMESTIC REFRIGERATORS

At the annual session of the American Medical Association held in Portland early this month the House of Delegates, recognizing the dangers of toxic gases used in industry and in the home, asked the Board of Trustees to appoint a committee to look into the situation and to advise the medical profession and the public for the good of the public health. A committee of men who have given special consideration to the subject has now been appointed and reports will no doubt soon be forthcoming as to the dangers involved and as to the needs of research in order to establish information not now available. The committee appointed by the Board of Trustees includes Dr. H. Gideon Wells, professor of pathology in the University of Chicago; Dr. R. L. Thompson of the United States Public Health Service; Dr. Carey P. McCord, associate professor of preventive medicine in the University of Cincinnati College of Medicine; Yandell Henderson, Ph.D., professor of physiology in Yale University School of Medicine, and Paul N. Leech, Ph.D., director of the chemical laboratory, American Medical Association. In the meantime additional deaths from the use of methyl chloride in mechanical refrigeration have occurred in Chicago as determined by a special coroner's jury, which has recommended the discontinuance of the use of methyl chloride as rapidly as possible, the temporary use of warning gases with methyl chloride until substitution of some less hazardous gas shall be made, and a definite warning by manufacturers to users of such apparatus as to the hazards involved. In order that users of mechanical refrigeration may have information, *The Journal* publishes, under general news in this issue, a list of various trade names of mechanical refrigerators with the type of refrigerant used in each instance so far as is now known.—*J. Am. M. Ass.*, 93: 288, July 27, 1929.

THROMBO-ANGIITIS OBLITERANS

The morbid anatomy of thrombo-angiitis obliterans was first described accurately in 1879, though from examination of one case only, by von Winiwarter, who incriminated excessive smoking as a causal factor. Special attention was directed to it in New York by L. Buerger, who insisted on its racial incidence, and in London by Parkes Weber. A recent Mayo Clinic monograph¹ gives a complete account of the disease, based on observation of over 300 cases and a thorough review of the literature. The cases were observed at the Mayo Clinic from 1922 to 1927, inclusive, and each year the number recognized increased so that finally this disease

accounted for 0.25 of all male admissions. Rather more than half the patients were Hebrews, but the incidence in Gentiles is increasing. The authors of this monograph regard abuse of tobacco as possibly a contributory factor, but not as primarily responsible; they consider that, though proof is still lacking, there is much evidence pointing to an infective origin. The average duration of thrombo-angiitis obliterans is five years. It begins with intermittent claudication due to anoxæmia; then follow postural changes, redness or pallor on dependency or elevation, and then pain, quite distinct from that of claudication, when the patient is at rest; lastly trophic lesions—ulceration and gangrene—supervene. But the clinical picture varies, and different types of the disease are described with an analysis of the symptoms. In two cases only was there reason to suspect coronary thrombosis, and it is remarkable that fatal pulmonary embolism never occurred, thus contrasting with post-operative phlebitis. With earlier diagnosis and treatment the prognosis is regarded in a more optimistic light than formerly. Special methods of investigating the disease employed by the authors include estimation of the rate of heat elimination, of the surface temperature, and of the vasomotor condition in the extremities. Treatment naturally depends on the stage of the condition. Prophylactic and other medical measures, such as radiant heat and non-specific protein shock therapy, are described; and the indications and results of surgical procedures, including sympathetic neurectomy, are passed in review. The authors note that all kinds of treatment were less effective in Hebrews than in Gentiles.—*Brit. M. J.*, 2: 24, July 6, 1929.

FATALITIES FROM THE GASES USED IN REFRIGERATION

Deaths as a result of gas leaks from automatic refrigerators, such as occurred in Chicago recently, are unlikely to be repeated very extensively elsewhere, in the opinion of government experts. Of 63 makes of electric and automatic refrigerators compiled in a recent list, only 23 make use of methyl chloride, the gas responsible for the Chicago fatalities, as a refrigerant. Of these, only one is a nationally advertised make. Furthermore, the only danger comes from central refrigerating plants, used in apartment houses, where the refrigerant is piped to a number of cold boxes throughout the building. Even when methyl chloride is used in a small independent home unit, a leak would not liberate enough of the gas to cause danger.

Sulphur dioxide, the choking gas that results from the burning of sulphur, is the most popular cooling compound, and is employed in the two most widely used electric refrigerators. While this is irritating to the nasal passages, it is not really poisonous, in the same sense as the poison gases used during the war. Its pungent smell is

1. Thrombo-angiitis Obliterans: Clinical, Physiologic, and Pathologic Studies. By George E. Brown, Edgar V. Allen, and Howard R. Mahorner. Philadelphia and London: W. B. Saunders Company. (14s. net.)

recognized before it reaches dangerous concentrations. Ammonia, used in many refrigerators, is safe for the same reason.

Methyl chloride is odourless, and, while it is not poisonous in itself, a large concentration would exclude the necessary oxygen, and death would result if a person were kept in a closed room with it. Many manufacturers use it in combination with either ammonia or sulphur dioxide, which have characteristic odours that reveal leaks. For a similar reason, manufacturers of illuminating gas, which consists largely of odourless and poisonous carbon monoxide, mix other gases with it that give the characteristic odour. One manufacturer of refrigerators makes use of ethyl chloride, which is not poisonous but is highly inflammable. Attempts have been made to mix methyl bromide with it to lessen the fire danger, but methyl bromide is truly poisonous.

Carbon dioxide, which makes up a large percentage of our very breath, is used in one make of refrigerator. This is also the refrigerant used in cooling systems of battleships.—*Science News-Letter*, July 13, 1929.

THE LIGHT REQUIREMENTS OF PLANTS

It might seem to the layman as if a growing plant out in the open undergoes such extremes of light and darkness that it would thrive under almost any conditions of quality or intensity of radiation. But this is not the case, and plants are easily affected by changes in the colour or duration of light, according to Dr. John M. Arthur, of the Boyce Thompson Institute, addressing the members of the Optical Society of America.

Though plants can be grown under electric light, some do not thrive if the light is kept on all the time. The tomato, he said, is killed by continuous illumination. After about five days a leaf injury appears and this increases until most of the leaves have withered and dropped off. In general, eighteen or nineteen hours a day of light gives as rapid growth as when the light is continuous. Buckwheat takes almost anything that is offered, for it flowers with anywhere from five to twenty-four hours of light a day.

Just as the short rays of light, known as the ultra-violet, cause sunburn and damage to the human tissues, so do they affect plants. Dr. Arthur also told of recent experiments which show that the very short waves will soon kill plants. Ultra-violet rays were produced with a quartz tube mercury vapour arc lamp. Filters were placed over the lamp to cut out some of the shorter rays. In this way it was found that when rays as short as 237 millionth of a millimetre (about one hundred-thousandth of an inch) were used, a large part of the leaf area of a tomato plant was killed in thirty seconds.

But when the shortest rays were 286 millionths of a millimetre, there was no injury at all. In sunlight at sea-level, the shortest ultra-violet rays are about 300 millionths of a millimetre in length. The shortest visible violet rays are about 400 millionths, and the longest red rays that we can see about 700 millionths. All of the visible colours come between these limits.—(*Science Supplement*, Nov. 9, 1928).

THE MOVEMENTS OF PLANTS

No more beautiful series of researches has ever been carried out than those recorded by Sir Jagadis Chunder Bose in his work on the Motor Mechanism of Plants. Certain definite movements in response to stimulation have long been known in connection with particular plant structures, such as the anthers of Berberis; but until Bose interested himself in the subject it was unsuspected that motility could be considered as a universal characteristic of plants, or that they possessed motor organs comparable to muscles, and conducting tissue comparable to the Purkinje fibres of the heart. The movements of the protoplasm within the cell membrane are well known to every student of botany, but it remained for Bose to show that under normal environmental conditions the cell exhibits a liquid tumescence or tonus, and that stimulation causes a depletion of liquid with a resulting diminution in the size of the cell—that is to say, a contraction. By means of experimental apparatus of extraordinary delicacy, devised by himself, Bose has succeeded in measuring the amount of this contraction in the individual cell, and has shown it to be about one thirty-millionth of an inch under feeble stimulation. Cells specially endowed with contractility are segregated into definite masses or tracts, somewhat analogous to muscles, subserving definite ends such as the movement of a leaf or the propulsion of sap; and they may be recognized microscopically by definite staining reactions. Bose has taken graphic records of the curve of contraction, with its latent or refractory period, its rapid rise and more gradual fall, and its associated electro-negative variation, as in animal muscle. He finds that the response is of the "all-or-none" type exhibited by heart muscle, and that the effect of physical and chemical agents and poisons on the curve corresponds to that observed in animal tissue. Of particular interest are the observations on rhythmical and peristaltic movements. Good examples are afforded by *Desmodium* and *Biophytum*. The small lateral segments of the trifoliate leaf of the former plant exhibit automatic rhythmical contractions, each contraction being completed in about a hundred seconds; of the latter plant, when in a condition of good tonus, it is said that a mere touch of one of its leaves may set all its leaflets quivering, throwing them, it would seem, into clonic spasm. The explanation of the automatic rhythmical

contractions is that usually accepted in the case of muscle—namely, the action of a continuous external or internal stimulus on a contractile tissue exhibiting a refractory period. Bose has made the interesting discovery of a connecting link between the single contraction or twitch and automatic rhythmical contractions. He has observed that while a single weak stimulus will provoke a single contraction, a single stronger stimulus will produce a series of several con-

tractions; thus it appears that the energy evoked by the stimulus is not exhausted in the initial contraction, but is gradually expended in a short series of automatic rhythmical contractions. Special interest will be taken in Bose's account of the mechanism concerned in the propulsion of the sap; but the whole book will be found to be a veritable romance of plant life.—*Brit. M. J.*, 2:54, July 13, 1929.

Abstracts from Current Literature

MEDICINE

Apparent Recurrences of Scarlet Fever. Kelleher, W. H., *Brit. M. J.* 1: 987, June 1, 1929.

The text of this paper is the occurrence of scarlet fever for the fifth time in the same patient. She was admitted to hospital for each attack, and the diagnosis in each instance seems to have been clear, although the attacks were not all of equal severity. The rash and desquamation were the features common to each attack. Adenitis was definitely present only at the first admission: sore throat did not occur on the last two occasions. Fever is not mentioned as being constant; in the second attack it reached 102° F. but in the last two it was not more than 99° F.

Other possible causes of the rashes were ruled out, such as drugs or occupation. She had had measles, chicken-pox and whooping-cough. None of the other members of her family had ever suffered from scarlet fever.

The author comments on the difficulty that may attend the making of a definite diagnosis of scarlet fever. Even the Dick test and Schultz-Charlton fading reaction have not cleared the way entirely. All attendant features of scarlet fever must be taken into account, especially the presence of complications such as albuminuria, adenitis, arthritis, otitis media, and a study of the appearance, order and nature of the desquamation. Even the latter, however, must be qualified by remembering that some scarlatiniform erythematata produce skin changes which are indistinguishable from those of scarlatinal peeling. In the latter the desquamation usually begins later and does not last so long as in the other.

There is a good deal of disagreement amongst various observers as to the possibility of repeated scarlatinal attacks. Goodall is quoted as saying that he has never seen more than two attacks in one person and doubt the occurrence of three or four attacks. Caiger has personally observed three genuine attacks. Everard cites an instance of five attacks, but

the first illness was complicated with chicken-pox and measles and the third and fourth by rheumatism.

H. E. MACDERMOT

The Development of Pulmonary Tuberculosis. Morlock, H. V., *The Lancet* 2: 60, July 13, 1929.

Nine cases of a group of fifty are presented in support of the newer views of many continental writers that the onset of pulmonary tuberculosis is a sudden rather than a gradual occurrence. (These views are given in detail in a paper by Rist in this *Journal* for August, 1929.) The term "early infiltration" is applied to a group of symptoms and signs which are said to be characteristic but often not recognized at this stage of the disease. Observations are made during or after an acute illness often diagnosed as "influenza" and there is detected a widespread area of infiltration, not at the extreme apex, but more prone to occur in the infraclavicular, or middle, or even basal zones. The onset is definite, acute, and not severe. The signs may be crepitations only; the roentgenological picture is well-defined, showing the infiltrated area; the general condition of the patient is good and like that of early or incipient tuberculosis. The general condition and the x-ray findings differentiate this from acute broncho-pneumonic phthisis. The disease may from this point progress to involve the apex and adjacent regions and then assume the picture of chronic phthisis, or the whole process may subside with scar formation over a period of a few months. The writer feels that this is a frequent and much neglected type of onset of pulmonary tuberculosis and that many more cases will be recorded if the clinical consciousness of observers is aroused to the phenomenon.

J. B. ROSS

Liver Therapy in Secondary Anæmia. Dyke, S. C., *The Lancet* 1: 1192, June 8, 1929.

In consideration of the fact that the experimental work which led to the discovery of the

remarkable and irrefutable effect of liver on primary anæmia was carried out on animals rendered anæmic by bleeding, it is reasonable to expect that some definite response should be shown by clinical cases of secondary anæmia. The red cell count and hæmoglobin percentage may not be a sufficiently accurate means of estimating this improvement and the writer uses the "reticulocyte response" which has proved to be so constant a finding in pernicious anæmia under liver therapy. In a small series it was found that certain cases of secondary anæmia showed a reticulocyte rise with a marked improvement in blood regeneration, that the response was greatly augmented by the simultaneous exhibition of large doses of iron, and that the cases which seemed to give the best results under this combination were those of failure of new blood formation after hæmorrhage. The reticulocyte response is taken to be an accurate gauge of the effect of treatment, when used in conjunction with the ordinary methods of blood examination.

J. B. ROSS

The Fate of Patients with Pleurisy. "Annotations", *The Lancet* 1: 1208, June 8, 1929.

Appreciating the tuberculous nature of most cases of "idiopathic" pleurisy, it must also be appreciated that the prescribing of a month's holiday, with vague directions as to rest and exercise, is inadequate. Recent statistics published by Swedish and Norwegian authorities show that from 22.4 per cent to 50 per cent of their pleurisy patients subsequently developed active pulmonary tuberculosis with a high mortality rate. In the *Norsk Magazin for Laegevidenskaben*, April, 1929, Dr. L. B. Smith shows how the expectation of tuberculosis in this class can be reduced by a careful regime. If possible the patient is admitted to the sanatorium, but, if this is not possible, definite instructions accompany him to his home. He must rest lying down, for five or six hours daily; he must do no work of any kind for three or four months,—until the sedimentation rate of the erythrocytes becomes normal. In 90 cases so treated over a period of eight years, the incidence of pulmonary tuberculosis was only 10 per cent as compared with the above percentages. The series is admittedly small, but it "emphatically indicates the profit accruing to a patient from the interpretation by his medical advisor of 'idiopathic' pleurisy as a condition requiring rigorous treatment and supervision for a long time."

J. B. ROSS

The Clinical Classification of Congenital Cardiac Disease. Abbott, M. E., *The Lancet* 217: 164, July 27, 1929.

This article is abridged from an address delivered by Dr. Maude Abbott, of Montreal, at the New Sussex Hospital, Brighton, on July 20, 1929.

Dr. Abbott remarks that clinicians do not always recognize the fact that congenital cardiac disease does not invariably mean morbus coeruleus ("Blue baby"), with its familiar symptom-complex of cyanosis, dyspnoea, clubbing, and its progressively downward course. Nothing can be done in these cases, of course. There is, in addition, she points out, a larger and, clinically speaking, a much more important group of cases of congenital cardiac disease, to which the term "acyanotic" applies. Here, if cyanosis ever does manifest itself it is a late phenomenon. In this latter group are included those cases only in which there is no abnormal communication between the two circulations, so that venous blood does not enter the arterial stream as a result of the anomaly.

A congenital cardiac anomaly of the acyanotic type can usually be "picked up" by detecting in an otherwise apparently normal individual a pulsation murmur or thrill of unusual localization and character in the cardiac area. Incidentally, these patients often display the slender build characteristic of aortic hypoplasia, a condition often associated with the congenital cardiac affection. A classification is given, to facilitate the clinical recognition of the two groups.

A. G. NICHOLLS

Insulin in Acromegalic Diabetes. Ulrich, H., *Arch. Int. Med.* 43: 785, June 1929.

It is a matter of much importance, not only on the clinical side but also in connection with the mechanism governing the development of pancreatic diabetes to know how non-pancreatic types of diabetes behave under the exhibition of insulin. The majority of those who have investigated this matter, among them John, Hetzel, Sachs and MacDonald, Blum and Schwab, Tater, and Cowell, hold that in one form of non-pancreatic diabetes, namely, the acromegalic, insulin is just as effective as in the pancreatic variety. Ulrich takes exception to the work of these observers, and in the present article combats their views, stating that, in his opinion, insulin is less efficient in cases of acromegalic diabetes than it is in diabetes occurring without acromegaly.

Ulrich analyses critically the various papers he refers to, with the idea of showing that the various authors' interpretations are not justified on the evidence they submit. He refers to

a case of his own of hyperpituitary disease in which the efficacy of insulin was impaired to a marked degree. The patient in question had had two attacks of glycosuria and hyperglycæmia. At autopsy he was found to have had a large pituitary adenoma. Ulrich also quotes a case of Nychler and Pasterny's in which the patient, suffering from a proved pituitary tumour, did not react to 60 units of insulin, so far, at least, as the hyperglycæmia was concerned.

Ulrich believes that the evidence at hand is sufficiently convincing to warrant the use of insulin for diagnostic purposes in cases of glycosuria that are suspected of having a pituitary basis. A demonstrable failure of insulin to produce its usual and expected results should be regarded as a link in the chain of evidence leading to a diagnosis of hyperpituitary disease.

A. G. NICHOLLS

Un nouveau signe de Sclérose aortique. (A new sign of aortic sclerosis). Trunecek, C., *Bruxelles Médical* 8: 768, 1928.

The diagnosis of sclerosis of the aorta is based upon the demonstration, either by percussion or by the use of the x-ray, of dilatation of that vessel. The author of this paper brings forward a new sign. It consists in this. In cases of sclerosis affecting the arch of the aorta pulsation of the subclavian artery is perceptible in the subclavicular fossæ on both sides; in cases where sclerosis affects the descending portion of the aorta the pulsation is to be found on the right side only.

A. G. NICHOLLS

Dysinsulinism Convulsion and Coma Due to Islet Cell Tumour of the Pancreas, with Operation and Cure. Howland, G., Campbell, W. R., Maltby, E. J., Robinson, W. R., *J. Am. M. Ass.* 93: 674, Aug. 31, 1929.

The authors report the following case.

A woman, aged 52, had been having indefinite attacks of semiconsciousness since 1922. These attacks gradually became more and more frequent and more severe. She was admitted to hospital in January, 1929. Dr. Ray Farquharson suggested that the convulsions and coma might be due to hypoglycæmia. The blood sugar during a typical attack measured 0.04 mgm. per 100 c.c., and prompt relief was obtained by the administration of dextrose intravenously.

The patient's course in the hospital was erratic. Her blood sugars were thoroughly studied; they followed no plan. When intravenous administration of 50 per cent dextrose was used to bring her out of a coma, it was very likely to be succeeded early by another attack of coma if sugar was not promptly given by the mouth. If however 100 grams of dex-

trose was given the blood sugar curve might be of the diabetic type.

A diagnosis was made of an islet cell tumour of the pancreas, inducing dysinsulinism.

At the operation, performed by Dr. Roscoe Graham, a tumour was enucleated from the body of the pancreas. No metastases were found. The pathologist's diagnosis was carcinoma originating from cells of the type of the islets of Langerhans. The tumour was found to contain insulin.

Recovery after the operation was uneventful. During the fourteen weeks following the operation there has never been any clinical evidence, subjective or objective, of the recurrence of the attacks in any form. They were encouraged to hope that spread of the tumour had not taken place.

LILLIAN A. CHASE

SURGERY

Subphrenic Abscess. Russell, T. H., *Ann. Surg.* 90: 238, August, 1929.

A true subphrenic abscess is located between the dome of the liver and the diaphragm. Generally, a collection of pus between the diaphragm and the transverse mesocolon is taken as a subphrenic abscess. Nearly all cases occur on the right side. Subphrenic abscess may be subsequent to peritonitis, appendicitis, cholecystic disease, pneumonia, empyema, perforated duodenal or gastric ulcer, or trauma, respectively. Actinomycosis of the colon may be responsible. The organism most frequently found is the colon bacillus. Streptococcus, staphylococcus, pneumococcus, pyocyanus, and, rarely, the Welch or tubercle bacillus, are also found. Infection may spread from a retrocæcal or normally placed appendix. Peristaltic action of the colon aids in carrying the infection up. Gas may be found in the abscess. It denotes the perforation of a hollow viscus, or the presence of a gas-producing infection, that is, *b. aerogenes capsulatus* or *bacillus coli*. The pus practically always has a foul odour. Subphrenic abscess may develop rapidly after an abdominal infection, or it may take a year or more.

Subphrenic abscess should be suspected when symptoms of disease appear in the lower chest or upper abdomen following abdominal disease. The patient is septic and has pain in the epigastrium, the right or left hypochondrium, or in the lumbar region, radiating to the upper thoracic vertebrae. Râles are present in the lower chest. The temperature is raised and is of septic type. Elevation usually occurs some time after the temperature from the primary condition has become normal. Leucocytosis is present. If the abscess is intraperitoneal paralysis of the diaphragm with depression of the liver is seen. Jaundice may develop. There

is usually rigidity and a sense of fullness on the affected side. Tenderness is frequently elicited. The use of an aspirating needle is dangerous and misleading. X-rays are of value in the diagnosis. Antero-posterior views in the sitting and prone positions should be taken.

An upper abdominal exploratory incision gives valuable information as to opening and draining the abscess. Routine resection of a rib for drainage is not advisable. Most cases can be drained at the lateral or posterior costal margin. Some cases may be drained intercostally. Definite evidence of pus in the posterior space is an indication for the latter type.

The published mortality rate varies from 20 to 50 per cent. Time is the vital factor. The earlier the active treatment, the better is the prognosis. A higher mortality rate is quoted in cases done through the transpleural as opposed to the trans-abdominal route.

R. V. B. SHIER

The Mortality of Intestinal Obstruction. Brill, S., *Ann. Surg.* 89: 541, April 1929.

In 295 cases of acute intestinal obstruction, recorded between 1880 and 1889, the surgical mortality was 70 per cent. A similar series of 1,000 cases reported in 1900 showed a mortality of 43.2 per cent. This improvement is attributed to better technique, better asepsis, and earlier operation. A series of 1089 cases from 1900 to 1925 gave a mortality of 41.8 per cent. Thus no improvement is to be seen since 1900.

The author reports a series of 245 cases with a mortality of 36.3 per cent. An analysis of this mortality shows 19 per cent due to chronic type, 30.1 per cent to acute type, and 80 per cent to acute post-operative ileus. In the acute cases the best results were obtained in obstructed herniæ, the mortality being 11.2 per cent. The value of early operation is shown in this series. During the first 24 hours 12.5 per cent died; in the next 24 hours 61.1 per cent; and after 48 hours, 50 per cent.

Acute post-operative ileus includes paralytic ileus due to the paralyzing action of suppuration, and ileus due to angulation produced by adherent coils of bowel. In these cases mortality may be due to the toxæmia of obstruction or of peritonitis. The value of enterostomy is doubted; 15 of 19 patients who required it died.

Toxæmia of acute intestinal obstruction is not relieved by hypertonic saline unless the obstruction is a high simple one. In this type the chlorides fall rapidly, and the carbon dioxide combining power and non-protein-nitrogen rise. This does not occur in low obstruction. Unless the chlorides are known to be low isotonic saline is preferred to hypertonic. Larger quantities of isotonic saline may

be given, thus aiding in overcoming the dehydration present.

The most important factor in the mortality of intestinal obstruction is delayed operation.

R. V. B. SHIER

PÆDIATRICS

Vitamin B Requirements in Infancy. Bloxson, A. P., *Am. J. Dis. Child.* 37: 1161, June 1929.

Brewer's yeast, for its vitamin B content, was given to 34 infants over a period of fifteen weeks. The four premature infants in the series showed a daily rate of gain in weight 79 per cent greater than that of premature infants not receiving yeast. The 30 full-term infants given brewer's yeast daily showed an average daily weight increment 100 per cent greater than those not receiving yeast. Most of the children were admitted because of malnutrition, upper respiratory infection, or need for regulation of feeding.

The control group in each instance is represented by a corresponding number of children admitted during the period preceding this study. No data are given for growth in length or growth of bone.

No ill-effects from the ingestion of brewer's yeast were noted. The author concludes that a substance rich in the growth-promoting factor of vitamin B should as a routine be added to the dietary from birth.

A. K. GEDDES

Dextrose Tolerance in Infants and Young Children. MacLean, A. B., and Sullivan, R. C., *Am. J. Dis. Child.* 37: 1146, June 1929.

MacLean and Sullivan have determined the dextrose tolerance of 13 normal children from five weeks to two and a half years of age, and of 97 sick children from three months to five years of age. The normal blood sugar curve in children is flatter than in adults. The average blood sugar reading three to four hours after a light meal was 96 mgm. per 100 cubic centimetres; one hour after the ingestion of dextrose (1.75 grams per kilogram of body weight) the average reading was 128 mgm.; and two hours after it was 113 mgm. The average maximum increase in the blood sugar was therefore 32 mgm.

Marantic infants showed decreased tolerance; infants undernourished, but not marantic, gave normal curves. Decreased tolerance was observed in diabetes mellitus and tuberculous meningitis. A tendency to increased tolerance was seen in infants with tetany and also in infants with encephalitis. Body temperature appeared to have no effect upon the curve. In children with acute infections the curve showed nothing characteristic.

A. K. GEDDES

Carbohydrate Tolerance in Infants and in Young Children with Coeliac Disease. MacLean, A. B., and Sullivan, R. C., *Am. J. Dis. Child.* 38: 16, July 1929.

In a series of fourteen patients with coeliac disease repeated tests consistently showed an increased tolerance for dextrose. After a four hour fast, and in some instances a sixteen hour fast, 1.75 grams of dextrose per kilogram of expected body-weight for age was given and blood sugar readings were made at hourly intervals. When larger amounts of dextrose, galactose, dextrose and galactose combined, and fructose, were given, the blood sugar remained at the same low level. After a mixture of equal part of dextrose and fructose was ingested, readings similar to those of normal children were obtained. The authors suggest that this may indicate a more normal metabolism of invert sugar and explain the coeliac patient's tolerance for bananas. In two cases dextrose was given intravenously to eliminate the factor of absorption from the intestines. The resulting curves were somewhat flatter than those of the normal controls.

The urine studies from these patients rule out renal glycosuria as an explanation for the increased carbohydrate tolerance in coeliac disease. It must then be explained as due either to a lack of absorption of carbohydrate from the intestine or to an endocrine dyscrasia. The authors are inclined to favour the latter view.

A. K. GEDDES

The Incidence of Congenital Syphilis Among Dependent Children. Jenks, H. H., and Donnelly, J. D., *Am. J. Dis. Child.* 37: 1198, June 1929.

Of one thousand dependent children, ranging in age from four months to sixteen years, most of them wards of child-caring institutions in Philadelphia, and 20 per cent of them negroes, definitely positive Wassermann reactions were found in 2.3 per cent. Three of these children had acquired syphilis, so that the incidence of congenital syphilis in the group was 2 per cent. Classified according to colour, the percentage occurrence in the negro children was 5.77 as compared with 1.39 in the whites.

In a group of 200 of these children chosen for special study, the percentage of illegitimacy was 52, but none of these illegitimate children gave a positive Wassermann reaction. In the entire group of one thousand children, 17 per cent were illegitimate and of these only one child showed any evidence of syphilis.

The authors compare their figures with the reports of other investigators.

A. K. GEDDES

OBSTETRICS AND GYNÆCOLOGY

Die physiologische Schwangerschaftshypertonie. (The Physiological Hypertonia of Pregnancy). Strassmann, E., *Arch. Gynäk.* 136: 345, 1929.

This is an extensive examination of the subject conducted on 230 women during pregnancy and the puerperium. In the case of one-half the patients the blood pressure remained unaltered; among the other half the pressure was raised 20 mm. in 20 per cent, and 30 mm. in 6 per cent. At the end of pregnancy the pressure reached a height of 130 mm. in 30 per cent. Readings of 150 mm. were common, even when the urine was normal. After confinement the blood pressure drops considerably. The figure reached was 110 mm. in more than 80 per cent. The lowest point is usually reached from the fifth to the eighth day after delivery. In one to two months the pressure returns to normal.

Increased blood pressure during pregnancy is to be regarded as physiological and the expression of the increased physical and chemical metabolic processes incident to that state.

A. G. NICHOLLS

THERAPEUTICS

"Activated" (Irradiated) Fluorescein in the Treatment of Cancer. Copeland, S. M., Coke, F., and Goulesbrough, C., *Brit. M. J.* 2: 233, Aug. 10, 1929.

Two years ago, Dr. Copeman exhibited at the London meeting of the International Cancer Conference several cases of inoperable cancer in whom the evidences of their disease had disappeared as a result of the use of a soluble salt of fluorescein followed by the application of a comparatively small dosage of x-rays or radium. These results were so gratifying that it was determined to follow up the observations with more extended research.

It has been known for some years, as a result of studies by von Tappeiner and Raab, Noguchi, Salant and Bengis, Pereira, and others, that lowly organisms such as paramoecium, or embryonic cells, including spermatozoa and ova, when exposed to the action of daylight in the presence of a dilute solution of eosin or fluorescein are rapidly killed, whereas, if protected from light no such lethal effect is produced. However, eosin and its relative erythrosin are inapplicable from a clinical point of view, inasmuch as they are definitely toxic, especially when injected intravenously. Fluorescein, on the other hand, appears to be perfectly non-toxic.

The authors, after discussion with Prof. W. E. Dixon, of Cambridge University, have investigated the possibility of obtaining beneficial

results in the treatment of cancer by the use of sodium fluorescein or other fluorescent salts, irradiated by means of wave-lengths of more penetrating quality than that characteristic of the rays of ultra-violet light. When employing x-rays they used a mild dosage, averaging 6 Holzknecht units (three-quarters of a pastille dose) screened through 4 mm. of aluminium. For the most part they used the sodium salt of fluorescein, but also the potassium and strontium salts, both of which seem to be innocuous for man. A solution of 2 to 2.5 per cent of sodium fluorescein is the one preferred. In the case of superficially situated ulcerated growths the solution was painted on, and this was usually done on two or three occasions before irradiation. In certain cases of deep-seated cancer the sodium salt was given by the mouth an hour or two before the exposure to the x-rays, in doses of 30 grains or more. This internal medication has never given rise to any unpleasant symptom. Experiments on mice show that the dye is not taken up selectively by malignant cells. The authors state that they have reason to think that in the case of internal cancers more satisfactory results may be obtained through the intravenous exhibition of the drug.

During the past seventeen months 70 cases of malignant disease (for the most part termed "inoperable") have been treated by them by means of "activated" fluorescein. Analysis of the cases gives the following results:—

Apparent recovery	8
Much improved	20
Too recent for statement.....	7
No change	8
Not improved	2
Discontinued treatment	12
Dead	7
Prophylactic	6

With regard to cases treated similarly elsewhere, four successful results are reported from King's College Hospital, and two private cases also apparently recovered. The authors also refer to other work done at Whipp's Cross and Westminster Hospitals, where radium was substituted for x-ray, in which it is shown conclusively that fluorescein is able to augment the action of radium. This is encouraging.

The following points are offered in conclusion.

(1) The cases which respond most satisfactorily are those in which other methods of treatment have not been tried. If patients have been subjected to courses of x-rays or radium, this will probable militate against obtaining useful results with fluorescein. (2) The more malignant the growth, the more likely it is to respond to treatment. (3) When fluorescein is given internally in cases of mammary cancer enlarged glands in the axilla have been known to disappear, although not themselves directly activated. (4) In the case of superficial secondary nodules the

injection of a few drops of fluorescein solution into the substance of the nodules prior to irradiation has caused even considerable masses to disappear with unexpected rapidity. (5) Cases previously regarded as inoperable, after a course of treatment with activated fluorescein, have, in certain instances, been found, at a comparatively early stage, to have undergone such change as to render them amenable to surgical intervention, with satisfactory results.

A. G. NICHOLLS

PATHOLOGY

A New Index of Intestinal Putrefaction. Mutch, N., *Lancet* 1: 1034, May 18, 1929.

The writer claims that the indicanuria test for intestinal putrefaction is too delicate for clinical use, in that very slight variations from normal digestion may result in indicanuria, such variations not rising to the level of an abnormality. The reason for this finding is that indican, being a tryptophane derivative, is liberated as a terminal product of ileal digestion and very minor disturbances prevent the few final steps being completed. Tyrosine, on the other hand, is liberated at a very early stage of digestion, and if intermediate products of tyrosine digestion appear in the urine, it can be assumed that a great part of protein digestion is abnormal. The most important of these products is an acid-p-hydroxyphenyl-acetic,—for which a test in the urine is outlined:—

Take 50 c.c. urine; add 5 c.c. of 25 per cent sulphuric acid and 15 c.c. of ether, shake, remove 2 c.c. ether; evaporate over warm water. Add Millon's reagent drop by drop and boil. A positive reaction is indicated by a red colour. (Quantities approximate).

The eating of cheese within twenty-four hours prior to the test, or the taking of salicylates will cause a false colouration. Three factors are found to be of great importance in the production of a positive reaction—ileal stasis, *B. coli* infection of the ileum (as determined by cultures at operation), and gastric hypochlorhydria. A negative finding is of doubtful importance but a positive one is always significant. The incidence is about 50 per cent as high as a positive indican test.

J. B. ROSS

ANÆSTHESIA

The Thyroid Obsession. Morse, J. L., *Anæst. & Analgesia*, p. 256-258, July-August, 1929.

It has been stated that a child who has enlargement of the thymus gland should not be anæsthetized until the gland has been reduced to normal size, by treatment with the roentgen ray. The shadow of the thymus, as revealed by x-ray examination, varies according to the position of

the child. It is larger in inspiration than expiration. It changes in size from day to day, possibly from hour to hour. Moreover, the shadow gives no indication of the thickness of the gland. There is no certainty as to what is the normal size of the thymus gland. Nor is it known whether increased size is associated with increased secretion. Children sometimes die suddenly from apparently trivial causes and are found post-mortem to have had status lym-

phaticus. On the other hand, sudden deaths also occur where this condition is not found. The question arises whether these deaths under anaesthesia were not due to faulty anaesthesia in operating. The writer thinks that it is unreasonable to say that a child before operation should have an x-ray examination to determine the size of the thymus and treatment if the gland appears to be enlarged.

W. B. HOWELL

Obituaries

Dr. A. E. Gardiner. The death of Dr. A. E. Gardiner, of McAdam Junction, N.B., occurred on August 21st. He was a graduate of Mount Allison and McGill Universities. Dr. Gardiner was at first located at Mace's Bay, but for the past twenty-one years had practised at McAdam. He served overseas during the war as medical officer of the 55th Battalion.

He is survived by his widow; one son, Arthur; and one daughter, Mrs. Roy Towle.

Dr. L. D. Mignault. We regret to have to announce the death on August 24, 1929, at his residence in Montreal, of Dr. Louis-Daniel Mignault, at the age of seventy-three. He had been ill for more than a year.

Dr. Mignault was born at Worcester, Mass., on June 3, 1856, and was educated at St. Mary's College, Montreal, and at McGill University, where he received his doctorate in Medicine in 1901. He was at one time a professor in Victoria University, and later at the University of Montreal. In the latter institution he held the Chair of Anatomy from its foundation until about one year ago. Dr. Mignault was a Knight Commander of the Order of St. Gregory the Great.

He is survived by his widow, one son, and three daughters. He was a brother of the Honourable Mr. Justice P. B. Mignault.

Dr. John J. Gardner, of Montreal, died at the Montreal General Hospital on August 31, 1929. He was a well known eye specialist and one of the oldest

practitioners in the city. He graduated in medicine at McGill University in 1883, and was on its teaching staff, as Lecturer in Ophthalmology, from 1897 to 1903. He was also for some years attached to the Montreal General Hospital, as oculist and aurist, and was Consulting Ophthalmologist to that institution at the time of his death. Dr. Gardner was a brother of the late Dr. William Gardner, in his lifetime a widely known and highly esteemed gynaecologist, who also held the Chair of Gynaecology at McGill University.

Dr. Gardner is survived by his widow and several sisters.

Dr. Donat Handfield, of Montreal, died suddenly on September 9, 1929, at his residence, 1405 Dufresne Street, in his 44th year. Dr. Handfield studied at Ottawa University, finishing his medical course in the University of Montreal in 1907. He also studied in Europe and under Dr. Chrétien-Zaugg of Montreal.

Dr. L. A. Bernard died at his residence, 1284 Maisonneuve Street, Montreal, on August 14th.

Dr. R. E. Guy Smith of Westmount, Que., died on September 16, 1929, in his sixty-second year. He was a graduate in Medicine of McGill University of the year 1896. Dr. Smith was a native of Woodstock, N.B. He never practised his profession, but devoted himself to finance and works of philanthropy. Dr. Smith is survived by his widow, two sons, and three daughters.

TOBACCO SMOKING.—In a series of 150 adult smokers reported on by Wingate M. Johnson, the systolic blood pressure was 128.23, the diastolic 78.87. In the same number of non-smokers, the average systolic pressure was 129.64, the diastolic 79.23. The average age was practically the same, 42.63 years for the smokers, 42.41 for the non-smokers. The weight of the smokers was 164.44, of the non-smokers 161.08. The height was the same. Of sixty fatal cases of angina pectoris in males, 42, or 70 per cent, were in smokers; eighteen, or 30 per cent, in non-smokers. As a control, of 1,000 adult males taken from telephone directories in five cities, 81.8 per cent were smokers. In a series of twenty individuals

tested, the blood pressure after smoking showed no change in five but dropped in fifteen. The average fall in blood pressure after smoking for the whole group was 4.9 systolic, 3.4 diastolic. Johnson concludes from these data that tobacco smoking apparently has no permanent effect on the blood pressure. There is no foundation for the popular belief that smoking decreases the weight of an individual. It is doubtful whether tobacco plays a major part in the etiology of angina pectoris. The act of smoking, if it affects blood pressure at all, reduces it temporarily. The effect of tobacco smoking is chiefly local, exerted principally on the pharynx.—*J. Am. M. Ass.* 93: Aug. 31, 1929.

News Items

GREAT BRITAIN

The Radium Situation

Last April the Radium Sub-Committee of the Committee of Civil Research issued its report on radium in the treatment of cancer, and the Government thereupon promised to make a grant of £1 for every £1 subscribed by the public for the purchase of a national stock of radium up to a limit of £100,000. At the end of that month the Presidents of the Royal Colleges of Physicians and Surgeons and other distinguished members of the medical profession addressed to *The Times* an appeal for £150,000, to be the public contribution to the National Radium Fund.

It was agreed, in order to avoid competing appeals, that this public contribution should form part of the Thank-offering Fund for the King's Convalescence, and that close co-operation should be maintained between the National Radium Fund and King Edward's Hospital Fund for London, the sponsors of the Thank-offering Fund.

The Times opened a National Radium Fund the next day and within a week the sum of money required had been subscribed, the King and Queen, the Prince of Wales, and other members of the Royal Family being early contributors. The National Radium Fund stands to-day at more than £187,000.

Two bodies had been designated by the Sub-Committee of the Committee of Civil Research to deal with the Fund—the National Radium Trust and the National Radium Commission. The duty of the Trust is to hold the Fund and to purchase therewith and hold radium for use by the Commission. The Commission's duty is "to deal with the custody, distribution, and use of all radium held by the trustees, having regard to the advancement of knowledge, the treatment of the sick, and economy of use, and, in particular, to consider and approve plans submitted to them for the use of radium for the purpose of medical treatment and research and to make the necessary arrangements for the supply of radium for such uses." The Trust, as now constituted, has the confidence alike of the Government and of the medical profession. The Commission is so constituted as to contain an effective majority of members representing the skilled and experienced workers on the staffs of the voluntary hospitals.

The National Radium Trust is constituted as follows:—

The Right Hon. Lord Parmoor, K.C.V.O., K.C., Lord President of the Council (Chairman); the Right Hon. Arthur Greenwood, M.P., Minister of Health; the Right Hon. W. Adamson, M.P., Secretary of State for Scotland; Sir Ernest Rutherford, O.M., President of the Royal Society; Sir John Rose Bradford, K.C.M.G., M.D., President of the Royal College of Physicians; the Right Hon. Lord Moynihan of Leeds, K.C.M.G., C.B., President of the Royal College of Surgeons; the Right Hon. Lord Dawson of Penn, G.C.V.O., K.C.B., K.C.M.G., M.D., F.R.C.P., President of the Royal Society of Medicine; the Hon. Lord Maekenzie, LL.D., Chairman of the Central Liaison Committee for Voluntary Hospitals in Scotland; Professor A. H. Burgess, M.B., B.Sc., F.R.C.S., President of the British Medical Association; and the Right Hon. Viscount Lee of Fareham, P.C., G.C.B., G.C.S.I., G.B.E.

THE COMMISSION

The Radium Commission has now been set up in accordance with the provisions of the Royal Charter, and is composed as follows:—

Chairman: The Right Hon. the Viscount Lee of Fareham, P.C., G.C.B., G.C.S.I., G.B.E. (appointed by the National Radium Trust); Lieutenant-Colonel Smallman, C.B.E., D.S.O., M.D., Medical Officer of the Ministry of Health (appointed by the Minister of Health); H. L. F. Fraser, Esp., LL.B., Assistant Secretary of the Department of Health for Scotland (appointed by the Secretary of State for Scotland); Professor Sidney Russ, D.Sc., Professor of Physics, Middlesex Hospital Medical School (appointed by the Medical Research Council); G. W. C. Kaye, Esq., O.B.E., D.Sc., Superintendent of the Physics Department of the National Physical Laboratory (appointed by the Department of Scientific and Industrial Research).

And the following members appointed by the Trust from the panel of 12 persons selected by the heads of the medical profession under Article 4 (2) of the Charter, as "having special knowledge and experience of the application of radium in the treatment of the sick":—

J. M. W. Morison, Esq., M.D.Glas., F.R.C.P.Ed., Lecturer in Radiology, University of Edinburgh; Professor G. E. Gask, C.M.G., D.S.O., F.R.C.S., Professor of Surgery, University of London; W. Ernest Miles, Esq., F.R.C.S., Surgeon to the Cancer Hospital, Brompton; Comyns Berkeley, Esq., M.D., F.R.C.P., F.R.C.S., Gynaecological Surgeon to the Middlesex Hospital; Carlton Oldfield, Esq., M.D., F.R.C.P., F.R.C.S., Professor of Gynaecology, University of Leeds; and Professor A. J. Hall, M.D., F.R.C.P., Professor of Medicine, University of Sheffield.

The New Vaccination Order

The Ministry of Health has issued this week to boards of guardians a circular, No. 1025a, with reference to a new Order (Statutory Rules and Orders, 1929, No. 640) which the Minister has made under the Vaccination Acts. The purpose of the Order, which will come into force on October 1st, is to give effect to the first four recommendations printed at page 201 of the report of the Committee on Vaccination presided over by Sir Humphry Rolleston. The recommendations dealt with in the new Vaccination Order are as follows:

(1) In place of the officially advocated four insertions, trial should be made of vaccination and revaccination in one insertion with a minimum of trauma, and that multiple scarification and (or) cross-hatching be deprecated.

(2) Primary vaccination should be performed in infancy, between the ages of 2 and 6 months as at present, and revaccination be offered at the time when a child enters school (6 to 7 years), and again on leaving (14 to 16 years).

(3) Vaccination in multiple insertions should be available for such persons as desire to obtain the maximum protection against smallpox obtainable at one operation.

(4) In public vaccination parents should be informed that if, in consequence of vaccination, a child requires medical attention, it is the duty of the public vaccinator concerned to provide such attention without cost to the parents.

In the new Order effect is given to recommendations (1) and (3) by altering the present instructions to public vaccinators and the forms of vaccination contract. In future a public vaccinator should vaccinate or revaccinate in one insertion only, unless it is desired to

obtain additional protection against small-pox at one operation, when the number of insertions may be increased up to four. The aim should be to obtain successful vaccination with the minimum of injury to the tissues, and in no circumstances must the vaccinated areas be cross-scarified or cross-hatched. In compliance with recommendation (4) changes are made in the Form of Notice of the requirement of vaccination given by registrars of births and deaths, in order that parents or guardians may be informed that, if vaccination is performed by a public vaccinator, it will be his duty to attend and prescribe such treatment as is necessary without charge to the parent or guardian, if in his opinion the child needs medical treatment in consequence of the vaccination. A new paragraph has also been added to the Form giving effect to recommendation (2), and authority is given to a public vaccinator to re-vaccinate any person who applies to him without reference to the period which has elapsed since the last vaccination.

The circular draws attention to the remarks of the Rolleston Committee on the occurrence of cases of "post-vaccinal nervous disease." The committee pointed out that, however seldom such cases might occur, they were of serious import, and could not fail to have an effect on vaccination both in its administrative and in its purely medical aspects. But the report also pointed to the extreme rarity of such manifestations, particularly after revaccination and after primary vaccination in early infancy, and the committee concluded that early infancy remains the time of choice for primary vaccination. The Minister recognizes that "post-vaccinal nervous disease", both in this country and abroad, has occurred mainly in children of school age or adolescents who had never previously been vaccinated, and that this fact emphasizes the desirability of securing the successful vaccination of infants. Where this has not been attained, the question which arises is whether it is advisable to vaccinate children of school age or adolescents. The Minister is of the opinion that, in the present state of knowledge, and so long as the small-pox prevalent in this country retains its present mild character, it is not generally expedient to press for the vaccination of persons of these ages who have not previously been vaccinated, unless they have been in personal contact with a case of small-pox or directly exposed to small-pox infection.

Medical Research Council

By an Order of the Committee of Privy Council, Lord D'Abernon and Mr. A. G. Church, M.P., are appointed members of the Medical Research Council, on the retirement of Lord Balfour and of Sir Charles Trevelyan, M.P. Lord D'Abernon will succeed Lord Balfour as Chairman of the Council.

By another Order, made after consultation with the Medical Research Council and with the President of the Royal Society, Professor J. J. R. Macleod (Regius Professor of Physiology in the University of Aberdeen) and Mr. Wilfred Trotter (Honorary Surgeon to the King, and Surgeon to University College Hospital, London) are appointed members of the Council, in succession to Professor E. P. Cathcart and Sir Charles Sherrington, who will retire in rotation on September 30.

The Primary F.R.C.S. Examination in Canada

Much interest has been evinced, in England and Canada, and the United States, in the fact that for the first time in history the primary examination for the diploma of F.R.C.S. has been held outside of Britain. The *Journal* gave an account of the matter, editorially, last month. The *Lancet* has this to say in a recent issue. "The Canadian Medical Association was responsible for the arrangements, and much of the success

of this new departure was due to Dr. Alexander Primrose, dean of the Medical Faculty of the University of Toronto, and Dr. T. C. Routley, general secretary of the Canadian Medical Association, who took an active part in bringing about this attempt to offer to Canadian medical practitioners greater facilities for obtaining the F.R.C.S.Eng. There is a strong desire in Canada for closer association between the medical profession in the Dominion and in this country, and much interest has been taken in Canada and the United States in the undertaking. The examiners were received by the Governor-General at Quebec and by the Prime Minister at Ottawa, who expressed sympathetic interest in their mission. The Final Examinations for the Fellowship will be conducted only in England, but the opportunity of passing the primary examination in Canada should make two visits to this country unnecessary, and so, it is hoped, bring the F.R.C.S.Eng. within the reach of a larger number of Canadians than has hitherto been the case."

Health at the Jamboree

The organization of the Boy Scouts' World Jamboree at Arrowe Park, Birkenhead, nowhere showed to better advantage than in the medical department. The hospital, which was in charge of the Medical Commissioner, Lieut.-Colonel J. C. Holdich Leicester, consisted of nine marquees and six bell tents. Four of the marquees were wards, each holding sixteen beds. Another was divided into two parts, one-third of its space being used as a dispensary and the rest as an emergency operating theatre. A sixth marquee, similarly divided, served as a dental clinic and an out-patient department. The remaining three were used respectively as an office, a store, and a dining tent for the staff. One of the bell tents was a store-room for patients' clothing and the other five were isolation wards. A small portable plant supplied the hospital with electric light, and all the units were linked by telephone. Cooking was all done out-of-doors under a corrugated iron roof. The Cheshire Girl Guides Association supplied the entire nursing and executive staff, whilst Colonel Leicester was assisted in his medical work by three local practitioners and a number of local honorary consultants. The dental clinic was under the supervision of Mr. H. H. Tomlinson, who was assisted by a staff of six dentists.

More than 30,000 scouts attended the camp, and it is surprising that in the three weeks only 321 had to be admitted to hospital. Of these, 52 were evacuated to local hospitals as being likely to need attention for more than a few days; this figure included nine cases of infectious disease sent to Birkenhead Fever Hospital. All the rest returned to their units relieved or cured. Tonsillitis accounted for 70 cases, and the next commonest types of ailment for which admission was necessary were cuts, stings, or bruises (39 cases). These were followed closely by chills, malaria, and malaise (28 cases), and pyrexia (26 cases). There were 21 fractures and dislocations, 14 sprains, 15 cases of constipation and colic, and 14 of other stomach troubles. Considering the mud and damp in which the camp has lived, the proportion of respiratory disorders was low; there were 11 cases of asthma, bronchitis, and catarrh; 8 of "influenza"; and 7 of pneumonia and pleurisy. Coughs and colds might have been expected to number more than 80, while rheumatism accounted for only 3 admissions. Twenty operations were performed for the reduction of fractures and repair of other injuries. The out-patients' department was attended by 1,229 boys, 271 of whom had cuts and wounds (68 septic), and 125 had boils. Scalds, burns, sunburns, and abrasions accounted for 108 more. Naturally the greatest number of in-patients were English: 160. The French followed with 47; and the Scottish 12, Welsh 12, Irish 11, and American 9, came next. A really remarkable absence of epidemic disease and of serious illness in such a large concourse

was very largely due to efficient hygienic precautions taken by the Assistant Camp Chief (Health), Major M. B. Ritchie, ably seconded by the Hygiene Commissioner, Dr. Richard Wyse. The stagnant pools in the woodland areas were freed from infestation and the water supply was carefully planned. The latrines were adequate in number and suitably placed, and an expert staff saw to their emptying and cleansing. The camp was patrolled by members of the St. John Ambulance Brigade and the British Red Cross Society, and whenever possible the boys were medically examined before coming to camp. There was a first-aid post under medical supervision at the rest camp organized at Earl's Court for scouts who wished to stay in London before or after the Jamboree. Here, again, local hospitals co-operated cordially. The organizers and medical staff are to be congratulated on the success of their work, which may well form a model for future encampments of the same kind.—*Lancet* 2: 396, Aug. 24, 1929.

In the same issue of *The Lancet* (p. 410) Major M. B. H. Ritchie writes as follows: "I think that the profession in general would like to know about the important part which many of its members played in the World Jamboree at Birkenhead. From home or overseas, some 70 doctors were in camp. They represented almost every branch of the profession—consultants, practitioners, medical officers of health, the services, teaching staffs, research, specialists, and students. Many are high in the Scout movement, many are actively associated in furthering its aims; some not desiring a "busman's holiday" were to be found in important non-medical appointments at the Jamboree, and were always ready to give their professional services when required; while others, non-Scouters, stood in to lend a hand in hospital or aid-post out of sheer goodness of heart. Years did not signify; among all, there was joy in their actions and the spirit of youth on their faces. It is delightfully refreshing to see eminent medical men in the boyish and rational dress of shirts and shorts. Medical necks and medical knees take on a fine shade of tan. And the spirit of comradeship and friendliness that sprang up was perfectly splendid. A medical Scouters' dinner was held, at which almost 50 were present. The Chief Scout received the members of the health organization (hygiene and medical staffs) on the last day of the Jamboree and expressed his great appreciation of the work they had done for Scouting.

It is fine to see so many members of our profession imbued with the spirit of scouting. For myself, it was a unique privilege to observe how magnificently they carry into practice the Scout doctrine of service to others.

I am, Sir, your faithfully,

M. B. H. RITCHIE,

Major, Royal Army Medical Corps; Assisant Jamboree Camp Chief (Health), World Jamboree, 1929.
Military Hospital, Colchester, August 19, 1929.

King Fuad at the Royal College of Surgeons

The King of Egypt paid a visit, on August 1st, to the Royal College of Surgeons of England, and was made an Honorary Fellow of the College. Lord Moyrihan, the President, on presenting the diploma to King Fuad, referred to the close connection of the Royal College of Surgeons with the Egyptian School of Medicine. Fellows and members of the College had been teachers in the School, and until recently the post of dean had been held by an English Fellow of the College. Dr. Aly Ibrahim, the present dean, had recently been made an Honorary Fellow, and within recent years nine Egyptians, trained in the School at Cairo, had become F.R.C.S.Eng. by examination. The President also referred to the great personal interest His Majesty took in the faculty of medicine at Cairo and the Kasr-el-Aini Hospital, for the new building of which he lately laid the foundation stone. King Fuad, having signed the Roll of Honorary Fellows, inspected the museum and other parts of the building.

In Honour of Dr. W. W. Mayo

A window in the Eccles Parish Church of Manchester was dedicated on July 25th last to the memory of the late Dr. William W. Mayo, the father of Drs. Charles and W. J. Mayo, who was a Manchester man.

The Rhythms of Life

Professor D. F. Fraser-Harris, formerly Professor of Physiology at Dalhousie University, and well known to Canadians, has just brought out a book of essays entitled "The Rhythms of Life" (pp. 185; 5s.; London, George Routledge and Sons Ltd., 1929). In this little book are brought together various contributions that have at various times appeared in well known magazines and newspapers. Prof. Fraser-Harris' desire, clearly, has been to popularize useful scientific topics, and his easy, clear, and elegant style is a most excellent medium for the purpose. Among the subjects dealt with are: The Rhythms of Life, the first essay, which gives the title to the book; The Eye as a Camera; The comparative Sensitiveness of the Sexes; The Analysis of Taste; Our Debt to the Microscope; and The Causes of Colour.

The volume is interesting and deals simply, yet scientifically, with some of the fundamental principles arising out of physics, chemistry, and physiology. The book, therefore, has a real place among scientific works of an educative character.

NOVA SCOTIA

An energetic campaign is being carried on to obtain funds for a new hospital for the town of Digby.

Some months ago the Westwood Hospital, a private undertaking of Dr. C. E. A. DeWitt's, Wolfville, was taken over on lease by the Eastern Kings Hospital Committee, to be thenceforth conducted as a public institution under the name of the Westwood General Hospital. The Committee is now engaged in an effort to secure funds for a substantial enlargement of the hospital, and tenders have been called for the construction work. In Kentville, also, the provision of a general hospital in the near future seems to be assured.

Several years ago, the erection of a hospital at Berwick met the needs of the western part of Kings County, and the indications are that the eastern and central sections of the county will soon be well supplied with hospital accommodation.

The Committee appointed by the Medical Society of Nova Scotia to submit recommendations to the government of the province in respect of the proposed reorganization of the Department of Public Health has already come to some definite decisions. The government is asked that the Provincial Health Officer be given the status of Deputy Minister of Health, and

that all health activities be centred in the one department. Consideration of the employment of full-time health officers has been deferred. The participation of lay organizations in health work is approved, and the hope is expressed that their activities will be continued under the supervision of the Deputy Minister. The several branches of the Society are asked for opinions relative to the best method of providing additional bed accommodation for tuberculous patients.

A quinquennial reunion of old Dalhousians was held at the University on the 28th, 29th, and 30th of August, and attracted a large number of former students of the medical faculty. Notable among these were Doctors John Stewart, of Halifax, Finlay Mac-Millan, of Sheet Harbour, and Robinson Cox, of Upper Stewiacke, who were classmates sixty-six years ago, and have ever since been warm friends. Dr. Mac-Millan is the oldest living graduate of the Dalhousie Medical School.

The Saint Rita Hospital, at Sydney is to be opened some time during the month of September. To what was formerly known as the Ross Memorial Hospital a substantial addition has been made, and the institution has been named anew. Accommodation is provided for fifty patients. Furnishings and equipment are of the most modern type. The hospital is in charge of the Sisterhood of St. Martha, which was organized at Antigonish several years ago in connection with the housekeeping of St. Francis Xavier University, and later extended its activities to include hospital administration. Several hospitals are now being administered with conspicuous success by this Order.

The Nova Scotia Registered Nurses Association held its annual meeting at Sydney on the 23rd and 24th of August. The nurses were officially welcomed to Sydney by Dr. John K. McLeod, City Health Officer, who was deputed to represent the Mayor. The program of entertainment permitted the nurses to visit the hospitals of several towns in the proximity of Sydney.

The refresher course for physicians arranged by the Faculty of Medicine of Dalhousie University, held during the last week of August, proved very successful and was largely attended. The mornings were devoted to clinics by members of the Dalhousie faculty at the Victoria General, Camp Hill, Children's, and Maternity Hospitals and the Dalhousie Clinic. In the afternoons of the first two days, lectures by Doctors Colin Sutherland and W. G. Penfield, of McGill, were greatly enjoyed and thoroughly appreciated. The re-

maining afternoons were left free for participation in the events of the Dalhousie quinquennial reunion. For the assistance of Drs. Sutherland and Penfield the Refresher Course Committee is under obligation to the Canadian Medical Association, which made their presence possible.

The Nova Scotia Hospital Association met at New Glasgow on the 21st and 22nd of August. Medical men who took part in the proceedings were Drs. Harvey Agnew, of Toronto, and J. G. MacDougall, S. L. Walker, and Joseph Hayes, of Halifax. Dr. Agnew dealt particularly with fire prevention in hospitals. Dr. MacDougall spoke on the relationship of the medical staff to the hospital. Dr. Walker endorsed a proposal that a small monthly magazine be published by the Association. Dr. Hayes discussed the provision of accommodation for tuberculous patients in general hospitals. Among the resolutions passed was one requesting the removal of customs duty on equipment, not made in Canada, which is used only in hospitals. Mayor Fillmore, of Amherst, was elected to the presidency for the ensuing year, while Rev. L. McLellan, of Antigonish, was made Secretary. The Association is to meet next year at Sydney.

It is expected that Dr. James MacFarlane, of Toronto, will address the Cape Breton and the Eastern Counties branches of the Medical Society of Nova Scotia about the middle of September, and that Dr. John Fraser, of Montreal, and Dr. S. R. Johnston, of Halifax, will speak at Amherst, New Glasgow, Truro, Bridgewater, Yarmouth, and Kentville, some time in October. These lectures are being arranged in connection with the scheme for extra-mural post-graduate teaching of the Canadian Medical Association.

Early in September, Drs. K. A. MacKenzie and G. H. Murphy left Halifax to join a Canadian Medical Association "team" for a lecturing tour through the western provinces.

Major J. A. Murray, R.C.A.M.C., was tendered a farewell banquet at the City Club, August 22nd, by the officers of No. 22 Field Ambulance, on the eve of his departure from Halifax for Victoria, whither he has been transferred.

Dr. John A. Ferrell, of the International Health Division, Rockefeller Foundation, was a visitor to Nova Scotia in August. Accompanied by Dr. George A. MacIntosh, Provincial Health Officer, he motored through the eastern part of the province, making a study of the sanitary condition of several of the mining towns.

W. H. HATTIE

NEW BRUNSWICK

During the last month two operative tonsil clinics were held under the Department of Health, Medical School Inspection Branch. The first was at Havelock, N.B., on August 16th, the second at Florenceville, N.B., on August 20th. At both these clinics, Dr. L. DeV. Chipman, of Saint John, was in charge. He was assisted by Dr. Robert Hayes in both instances. At Havelock, other medical assistants included Dr. Rommell and Dr. C. A. King. At Florenceville Dr. Chestnut, of Hartland assisted.

The Campbellton Soldiers' Memorial Hospital is engaged at present in a campaign to raise \$25,000 to provide for necessary expansion.

The Saint John Medical Society was privileged in

August to hear an address by Dr. W. G. Penfield, of Montreal. Dr. Penfield discussed "Methods of Diagnosis in cerebral lesions". His address was remarkable for its simplicity and for the ease with which his hearers were able to follow a subject beset with marked difficulty. The discussion of the paper by listeners provided further interest and it is felt that with a single speaker the subject can be more carefully elaborated. The time allowed for discussion is obviously greater. The attendance at this meeting was large, and it is felt that its exceptional success was due to the fact that but a single topic was discussed.

Dr. Penfield's kindness in breaking his trip to Halifax is very much appreciated by the local society. We feel sorry that it was impossible for him to speak at other centres in the province.

Dr. K. A. Baird has established a practice in West St. John.

Dr. W. F. Roberts, of Saint John, is at present in Ontario as a representative of the local Kiwanis Club.

At the last meeting of the Saint John Medical Society, a group of standing orders for the Victorian Order of Nurses was approved. The work of the Victorian Order is becoming increasingly valuable in this province and not a little of this increased value is due

to the fine spirit of co-operation evidenced by the heads of this valuable nursing service.

Dr. Harold Gardiner, lately of the interne staff of the General Public Hospital, is now in practice at Sackville, N.B.

Dr. John M. Barry, Saint John, spent his holidays this year at his old home in Melrose, N.B.

Dr. W. E. Rowley, Saint John, is at present confined to his home by illness. A. STANLEY KIRKLAND

QUEBEC

As in past years the medical staff of the St. Vincent de Paul Hospital, Sherbrooke, held a "Clinical Day" on September 12th. The meeting was held under the auspices of the Committee on Refresher Courses of the Medical Association of the Province of Quebec. The program was arranged under the direction of the local secretary, Dr. R. Duberger. Four conferences were held. The first was conducted by Prof. A. LeSage, of the Notre Dame Hospital, Montreal, who took for his subject "Arterial hypertension;" the second by Dr. H. L. McKim, of the Montreal General Hospital, who spoke on "Infection of the hands;" the third by Prof. P. Z. Rhéaume, of the Hôtel-Dieu, Montreal, who dealt with "Gastrotomy and its indications." In the evening a dinner with a "round table" discussion was held at the Magog Hotel, at which Dr. Rosario Fontaine, of the Coroner's Court and the Department of Legal Medicine of the Province, discussed some medico-legal problems.

Plans were submitted at the annual meeting of the Chateauguay Board of Management of the Julius Richardson Convalescent Hospital, Chateauguay Basin, for the construction of a new wing, which would provide sufficient quarters for the hospital staff and also add to the accommodation. The Treasurer's report for the year was also read and adopted and showed a balance on hand of about \$3,000. The matron's report for the year showed that about 500 children had been given convalescent care during the past year and that no deaths had occurred among them. The Medical Board consists of Drs. T. P. Shaw, Chairman; Geo. D. Little, R. R. Struthers, Wm. Enright, and Graham Ross.

Half a million dollars is to be spent on a building in Montreal, now being constructed on Drummond Street just above St. Catherine Street. The building, with the exception of the ground floor, which is to be given over to shops, has been designed exclusively for doctors and dentists. It will be eleven storeys high, and will contain 40,000 square feet of office space. At the back of the structure, and with an entrance off a lane leading out on Drummond Street, there will be a garage five storeys high, capable of accommodating more than four hundred cars.

The Jewish community of Montreal has just concluded a campaign to raise a minimum of \$1,000,000 for the erection of a modern and well-equipped hospital. This hospital will be open to all, irrespective of race or creed, and will contribute another 150 beds to fill the disheartening gap in hospital accommodation from which this great city of a million so tragically suffers. The sympathy of the entire community, irrespective of race or creed, is with our Jewish friends in this public-spirited effort. The need cannot be denied. Montreal is badly under-hospitalised. Every movement to provide an additional hospital is worthy

of the most earnest public support. Then, it will be generally remembered that the Jewish community, in keeping with the traditions of their race, have always been mindful of their responsibilities, and the contributions they have made to the communal activities of the city, in addition to those outside of their own sphere to which they have been generous subscribers, are very properly recalled at this time. Through the Federation of Jewish Philanthropies and other agencies they have always taken good care of the unfortunate among their own people. The needs of little children have enjoyed particular attention, for the Jews have always been great in family life. Now they look forward to a fulfilment of a dream of long standing—a general and maternity hospital—which will be the culminating point of all their good work. We are glad to note their success.

The hospital promised by Premier Taschereau some months ago to the Montrealers of St. Henry's division will be erected next month. It is to be situated on College Street, next to the St. Henry Parish Church, and will be erected at a cost of more than \$300,000, about two-thirds of which, to be exact, \$230,000, will be paid by the Provincial Government. The new hospital will come under the Public Charities Act, and will contain 200 beds. It will be under the direction of the Grey Nuns, but open to citizens of all races and denominations. It is expected that its building will start early in September and will be completed early next spring. It is expected that the daily grants under the present ratio will allow the hospital to meet its expenses. Great care is to be given to the children's department, while the men and women's sections will be inferior to none.

The Faculty of Medicine of Laval University has been classed in Category A by the American Medical Association. The latter body, as most doubtless know, has been classifying faculties of medicine for the last few years, so as to eliminate undesirable schools, and to raise the standards of teaching in medical colleges.

The annual report of Dr. S. Boucher, Director of Health, covering vital statistics, which was issued recently, shows that births exceeded deaths in 1928 by 9,346. In 1928 there were 2,919 deaths of children under one year, or a percentage of 143.82 per 1,000 of population on the basis of calculation used by the city health department. There has been a decrease in deaths from diphtheria, cancer, and tuberculosis of the lungs in the past five years' period. The death rate has decreased constantly since 1918, while the birth rate has decreased since 1909.

A series of scientific lectures will be delivered this season at both universities under the auspices of the Franco-Canadian Scientific Institute. Professor Jean Gautrelet, director of the laboratory of experimental biology, at the Faculty of Medicine of Paris,

will speak at the University of Montreal on "Physiological technique," and at McGill on "The animal as factor of physiological response." Dr. Mouriquand, of the Faculty of Medicine of Lyons, will lecture on child hygiene. Professor Cabanne, of the Faculty of Medicine of Montpellier, will be the guest of both universities, where he will speak on the latest developments in practical physics. Dr. Cabanne is well known in Canada, following the research work in which he was engaged some time ago in connection with the University of Toronto. Some time in November, Professor Etienne Gilson will come to Montreal where he will lecture at both universities on medical philosophy and the early scholastics.

Visiting physiologists on their way home from their recent convention at Boston were the guests of the Province at a dinner at the Ritz-Carlton Hotel on September 5th. Hon. L. A. David, Provincial Secretary, presided and delivered the main address. Sir Arthur Currie, Principal of McGill University, was also present. Mr. David expressed the pride of the province in greeting some 300 prominent visitors from Great Britain,

France, Japan, Italy, Germany, Spain and the United States, all so distinguished by their world-known scientific efforts and achievements. Referring to the world desire for durable peace, the Minister gave this province as an example of what can be attained when good-will, co-operation, and public spirit are not lacking. He had seen many triumphs of British policies, he said, but none more typical than that which united for a common cause the sons of two great races. The toasts were proposed and seconded by Dr. Asselin, of the University of Montreal, and Prof. John Tait, of McGill University.

Sir Arthur Currie spoke of the part played by Canadians of French descent in the building of Canada and added a few remarks on the greatness of the country. "Nowhere in the world," he said, "is to be found a 4,000-mile corridor where such immense resources are to be found." Prof. Dr. Armin Tschermack-Seysenegg, of Prague, who spoke in German, Senator Foa, of Milan, Dr. Heron, of Montpellier, and Dr. McSwiney, of Leeds, England, expressed the pleasure of the visitors at the welcome they received here.

GEORGE HALL

MANITOBA

The provincial Department of Public Welfare and the provincial Sanatorium Board have modified a plan to erect a tuberculosis sanatorium in the Winnipeg district, for which the Manitoba legislature voted \$250,000 at its last session. Instead of the sanatorium the money, or a large portion of it, will be devoted to establishing a sanatorium for tuberculous children, and a central clinic whose chief function will be the examination of patients for discovery of incipient cases of tuberculosis. It is stated that the Sanatorium Board recently acquired the Pearl Street fire hall which is to be converted into a sanatorium for children. The Board is now negotiating for property in which the central clinic will be located.

The provincial government will erect during the winter a new custodial unit at the Selkirk Mental Hospital. The proposed unit will be a three-storey, plain brick building, with dormitories, dining rooms, recreation space, and workroom, for approximately 175 patients.

Up to September 3rd, fifteen cases of infantile paralysis have been reported in Manitoba, nine of these from districts which were only slightly affected, or escaped entirely, last year.

ROSS MITCHELL

SASKATCHEWAN

The sixteenth annual convention of the Sanitary Inspectors Association of Canada met in Moose Jaw for three days. E. W. J. Hague, President and Chief Health Officer for Winnipeg, in his presidential address, dealt with water supply, swimming pools, chemical refrigerators, illuminating gas, and carbon monoxide hazards in garages, and flies and body lice. Dr. B. M. Bayley, Medical Health Officer of Moose Jaw, spoke on "Communicable diseases." Dr. W. McDonald, Veterinary Inspector of Moose Jaw, spoke on "Bovine tuberculosis." James Arkle, sanitary inspector at St.

James, Man., spoke on "Building construction in relation to public health." In some states, he said, construction was not allowed in subdivisions unless there were paved roads and sidewalks, sewer and water connections already installed.

Dr. John G. Grant, who had intended to specialize in the practice of paediatrics in Regina, has decided to locate in Saskatoon, where he has opened an office.

LILLIAN A. CHASE

ALBERTA

What is said to be the best equipped hospital in any of the rural districts of Alberta is at present being erected at Bonnyville by Roman Catholic Sisters from France. It is finely situated on the north bank of the lake. It will have forty-two beds. The United Church of Canada also has a fully equipped hospital in this town.

A question of ethical practice was recently raised by a physician practising in a rural district. He is of the opinion that city consultants and practitioners should treat their country confrères just as they would their fellow practitioners in the city. A country patient should not be accepted for treatment except

in urgent cases, unless the physician who has been attending him in the country has been paid and dismissed from the case. This raises what may be considered a new issue, namely: should a patient's freedom to go from one physician to another be limited to the first physician who attended him, also to what extent should city physicians, by such refusals, assist in collecting the accounts of the country physicians?

Another question has been raised by doctors practising in the country. Should all country calls be answered, regardless of the time the call is put in or the nature of the patient's illness? Last spring, a physician, practising in one of the country districts, was called to see a child during the night. The roads

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were impassable for an automobile and the only livery team available at any time had all that day been driven from place to place and was wholly unfit for further work. The physician after explaining the situation suggested to the farmer who lived twelve miles from the town, that he should come in for him and he would be ready to go when he arrived. The farmer consulted his wife and then replied. "It will be all right to come at eight o'clock in the morning." The case apparently not being urgent, the physician replied, "I will not go in the morning."

The town of Mundare, the centre of the Ukrainian settlement, will soon have a good modern hospital which is being erected through public subscriptions. It will be capable of accommodating twenty-five patients.

Through the increase in the number of hospitals in the rural districts where there are large numbers of European settlers, and the greater use being made of them, there has been a very considerably lessened mortality, among women and infants especially.

Dr. P. P. Smyth, for many years in practice in Big Valley, has removed to Ocean Falls, B.C.

Dr. Reid, of the Rockefeller Institute, New York, recently addressed the members of the Calgary Medical Society on "Some of the uses of ephedrin."

Dr. M. R. Bow, Deputy Minister of Health in Alberta, addressed the members of the Calgary Medical Society on September 10th, on the subject of "Maternal mortality as a public health problem."

BRITISH COLUMBIA

At the annual meeting of the British Columbia Medical Association in Vancouver, September 25th and 26th, in addition to the routine business, an exceedingly interesting program had been arranged. Lectures were given by Dr. K. A. MacKenzie, of Halifax, N.S.; Dr. George S. Young and Dr. Gordon E. Richards, both of Toronto; Dr. George S. Murphy, of Halifax, and Dr. H. B. VanWyck, of Toronto. Dr. A. T. Bazin, of Montreal, President of the Canadian Medical Association, was also present and spoke on a number of occasions, and there were addresses by Dr. Ross Millar, of the Federal Department of Health; Dr. G. Harvey Agnew of the Department of Hospital Service, Canadian Medical Association; and Dr. T. C. Routley, General Secretary of the Canadian Medical Association. The meeting was featured by a golf tournament, and a number of social functions were arranged for the visiting ladies.

The outstanding recent event in medical circles in Vancouver has been the opening of the new Medical and Dental Building. This is a thoroughly up-to-date building of sixteen storeys located at the corner of Georgia and Hornby Streets. It contains office accommodation for approximately two hundred and fifty doctors' and dentists' offices; an auditorium which will seat 150, and houses the library of the Vancouver Medical Association and the library of the Dental Society. On the third floor a 20-bed hospital is provided, equipped with two modern operating-rooms. In the rear of the building a four-storey ramped garage provides accommodation for the tenants' motor cars.

On September 7th a formal opening was held when large numbers of visitors were shown through the building. It may be said, that the occupation of this building marks an epoch in the history of medicine in Vancouver.

Dr. Heber Jamieson, of the University of Alberta, is collecting data on the lives of the early medical practitioners in this province, and requests physicians throughout the province to furnish him with facts of interest in this work.

Dr. Michael Buriak of Radway Centre is now serving an internship in a hospital in one of the industrial centres of Pennsylvania.

Dr. J. W. Scott, of the Department of Biochemistry in the University of Alberta, is at present, engaged in post-graduate work in England.

Dr. T. R. Whaley of Alsask is now doing post-graduate work in New York. He intends settling in Vancouver.

Dr. R. K. Johnstone has given up his municipal contract practice at Brock, Sask., and has registered in Alberta.

Dr. A. D. Callbeck, of Stettler, who has been engaged in eye, ear, nose and throat practice, has left for the coast, where he will take a year's rest.

In our last issue an error appeared, in that it was stated that Dr. J. W. Auld of Calgary, had spent several weeks in Philadelphia doing post-graduate work in genito-urinary diseases. Dr. Auld writes to say that he spent six weeks recently in Philadelphia, under Schamberg, studying dermatology and syphilology. We regret the mistake.

G. E. LEARMONTH

The following physicians have become registered in British Columbia: Drs. William L. K. Cockle, of Trail, B.C.; Spencer G. Elliot, of Vancouver, B.C.; Einar H. Erickson, of Proctor, B.C.; Irma Kennedy, of Vancouver, and P. S. Tennant, of Armstrong, B.C.

Dr. H. H. McIntosh and Dr. W. A. Whitelaw have become associated in practice in new quarters in the Medical Dental Building.

Dr. A. B. Wilson, of Port Alberni, recently motored to his home in Edmonton on a visit.

Dr. G. Morris, of Port Haney, has resumed practice, following an extended visit to eastern centres.

Dr. P. A. McLennan is spending some time in the east where he will attend the meeting of the Dominion Medical Council.

Among the recent visitors to Vancouver were Dr. J. F. Hazard of Kimberly, Dr. E. L. Garner of Duncan, and Dr. A. E. H. Bennett of Ocean Falls.

Dr. G. A. Lawson of Port Alice is visiting his home on Shoal Lake, Man.

Dr. L. G. C. D'Easum, formerly of Ocean Falls, is practising in Chilliwack, B.C.

Among the contingent of golfers who attended the Totem Pole Golf competition at Jasper Park were: Drs. B. D. Gillies, Lyall Hodgins, N. E. MacDougall, and J. G. McKay.

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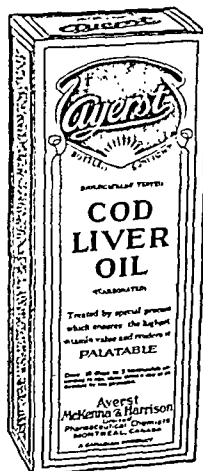
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UNITED STATES

The Nineteenth Annual Clinical Congress, American College of Surgeons

The American College of Surgeons will hold its nineteenth annual Clinical Congress in Chicago, October 14th to 18th. Headquarters will be at the Stevens Hotel. An intensive program is being planned to make this event the greatest in the history of the College.

The Hospital Standardization Conference will consist of morning and afternoon sessions on Monday to Thursday inclusive. There will be a series of clinical demonstrations, given by: George W. Crile, Cleveland; John B. Deaver, Philadelphia; John M. T. Finney, Baltimore; Charles H. Mayo, Rochester, and others. Monday evening's program will include an address of welcome by the Chairman of the Chicago Committee on Arrangements, Dr. L. Kretschmer; the address of the retiring President, Dr. Franklin H. Martin, Chicago; the inaugural address of the new President, Major-General Merritte W. Ireland, Washington, D.C.; and the John B. Murphy Oration in Surgery by Professor D. P. D. Wilkie of Edinburgh. Among the foreign visitors will be: Dr. James Heyman, of Stockholm; Dr. Thierry de Martel, of Paris; Visconde Aguilar of Madrid, and Mr. Herbert Tilley, of London. On the evenings of Tuesday, Wednesday and Thursday scientific papers will be presented by surgeons from the United States, Canada, and abroad. The Convocation of the College will be held on Friday evening. The Fellowship Address will be delivered by Dr. Glenn Frank, President of the University of Wisconsin. The annual meeting of the Governors and Fellows will be held on Thursday afternoon, followed by a symposium on cancer and bone sarcoma. An all-day session on traumatic surgery will be held on Friday, in which leaders in industry, labour, indemnity organizations, and the medical profession will participate. A special program has been arranged that will be of interest to those whose practice is limited to surgery of the eye, ear, nose and throat.

A feature of the Congress will be the showing of surgical films that have been produced under the supervision and approved by the Board on Medical Motion Pictures of the College. New developments in colour photography will also be demonstrated. In addition to the commercial exhibits, there will be scientific exhibits by the departments of the College.

A rate of one and one-half the regular one-way fare has been granted on railroads of the United States and Canada to those holding convention certificates.

Second Graduate Fortnight of the New York Academy of Medicine

Encouraged by the success of the First Annual Graduate Fortnight held last October, The New York Academy of Medicine has arranged for a second Fortnight, to be held October 7th to 19th of this year and has chosen as the subject "Functional and nervous problems in medicine and surgery." The field includes those functional disturbances which have been much neglected in the last thirty years in comparison with the structural disturbances of the human body. The topic covers differential diagnosis of functional and organic derangements in all branches of medicine and surgery. It is believed that the subject will attract not only the medical profession generally but also social workers and those interested in public welfare.

In the afternoons a number of the large hospitals of the city, with an abundance of clinical material, will co-operate in the Fortnight by presenting specially arranged clinical programs bearing upon different phases of the general subject. Besides the special

programs which will be presented, over forty of the teaching hospitals of the city will offer (mornings and afternoons) non-operative clinics and clinical conferences in various clinical specialties, and in mental hygiene subjects such as behaviour and habit problems, child guidance, and vocational adjustment.

Evening sessions will be held at the Academy at which well known authorities will discuss many phases of the general subject.

The Chairman of the Graduate Fortnight Committee is Dr. Harlow Brooks, 47 West 9th St., New York City.

The Inter-State Post-Graduate Medical Association of North America

A meeting of this Association will be held at Detroit, Mich., from October 21st to 25th, inclusive.

The President is Dr. John B. Deaver, Philadelphia, and the President-elect is Dr. William D. Haggard, Nashville, Tenn.

A splendid program has been provided. We note the names of Canadians who will take part: Drs. Alan Brown, Toronto; H. B. Cushing, Montreal; D. Graham, Toronto; Alexander Primrose, Toronto; C. P. Howard, Montreal. A number of distinguished visitors from Europe are expected. Among them are: Dr. J. M. LeMée, Paris; Dr. Thomas K. Monro, Glasgow; Sir Frank Colyer, London; Professor E. F. Müller, Hamburg; Dr. T. de Martel, Paris; Prof. D. P. D. Wilkie, F.R.C.S., Edinburgh; Dr. Ferd. Sauerbruch, Berlin.

All necessary information can be obtained from the Managing Director, Dr. William B. Peck, Freeport, Ill.

The Clinical Congress and the Eighth Annual Meeting of the American College of Physical Therapy, November 4, 5, 6 and 7, 1929, at the Hotel Sherman, Chicago

Chicago has again been selected as the annual meeting place for the Clinical Congress of Physical Therapy of the American College of Physical Therapy.

One of the novel features to be inaugurated this year is the clinical part of the program. One half of each day will be devoted to a variety of clinics in the sections on medicine, surgery and allied specialties, and eye, ear, nose and throat. Education in physical therapy will be thoroughly stressed, as the time has come when this phase of the subject must be given due emphasis by an organization such as the American College of Physical Therapy. Scientific papers, clinical addresses, demonstrations of technique, and scientific and technical exhibits, will comprise the remainder of a scientific program which merits the attention of all those interested in the newer fields of medicine. Attendance at the congress is not limited to the fellows of the College, as all duly licensed physicians, their technicians and assistants, properly sponsored, are cordially invited to attend all the sessions.

The program and any other information may be obtained by writing to the Executive Offices, American College of Physical Therapy, Suite 716, 30 N. Michigan Avenue, Chicago, Illinois.

The American Board of Otolaryngology

An examination was held in Portland, Oregon, July 8th, during the meeting of the American Medical Association. Thirty-seven applicants appeared for examination, with 11 per cent of failures.

The next examination will be given on Monday, October 21st, in Philadelphia, preceding the opening

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of the meeting of the American Academy of Ophthalmology and Otolaryngology in Atlantic City.

Prospective candidates for certificates should address the Secretary, Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Nebraska, for proper application blanks.

Noise in Chicago

A determined effort is being made in Chicago to see if in any way the distressing noise prevalent in the business sections of that city can be reduced. This investigation is being carried out at the instance of the Chicago Surface Lines, by Prof. J. K. Tuthill, of the Electrical Engineering Department of the University of Illinois. He is spending about three months in experimenting to determine the intensity of noise and what may be done to street cars particularly to make their operation less annoying.

Professor Leriche

Professor René Leriche, of Strasbourg, France, was recently granted the degree of Doctor of Science *honoris causa* by Harvard University. Professor Leriche has been at the Peter Bent Brigham Hospital, Boston, where he

has been in temporary charge of the surgical clinic, on the invitation of Professor Harvey Cushing. This is the first time, it is said, that this honour has been conferred on a French medical man.

The American Association for the Study of Goitre

The Executive Council of the American Association for the Study of Goitre announces that a prize of three hundred dollars (\$300.00) and a medal of honour will be awarded by the Association to the author of the best essay based upon original research work on any phase of goitre, presented at their annual meeting at Seattle, Washington, in September, 1930.

Competing manuscripts must be in the hands of the Corresponding Secretary by July 4, 1930, so that the award committee will have sufficient time to thoroughly examine all data before making the award.

Full particulars of other regulations governing details of the offer will be furnished on application.

The American Association for the Study of Goitre hopes this offer will stimulate valuable research work on the many phases of goitre, especially on its basic cause. J. R. Yung, Corresponding Secretary, Rose Dispensary Bldg., Terre Haute, Ind., U.S.A.

GENERAL

The Thirteenth International Physiological Congress

The Thirteenth International Physiological Congress met this year in Cambridge, Massachusetts, from August 19th to 23rd, under the general presidency of Prof. W. H. Howell, of Johns Hopkins University. The meeting was notable not only for the eminence of many of the members but for the large attendance. Considerably more than 1,600 were present. Only 250 had been expected from Europe and the east, but 750 appeared. Thus the resources of the committee of arrangements were considerably taxed. The most notable of the delegates was, probably, Prof. I. P. Pavlov, the veteran physiologist of Leningrad, now in his eightieth year, and still active. Professor Pavlov paid a flying visit to Montreal after the close of the Congress, in order to see his former assistant and friend, Prof. B. P. Bablin.

A special interest for us here attaches to the fact that a substantial proportion of the visiting physiologists included Canada in their itinerary. The official delegation consisted of 142 members, who on their way here visited Wood's Hole, New Haven, New York, entering Canada at Niagara Falls. So many others were desirous of visiting Canada, however, that another trip was organized by Cook's Tourist Agency. This party, which numbered 107, went to Rochester, N.Y., where they visited the University and were entertained there. After visiting Niagara Falls, both parties proceeded by boat to Toronto, and then continued on through the Thousand Islands and the rapids of the St. Lawrence. While in Toronto they visited the University and were entertained by both the Province and the University. Cook's party arrived in Montreal on the evening of September 3rd and the official party on the next day.

Among the distinguished visitors the following were noted: Professors or Doctors Emil Abderhalden (Halle), Léon Binet (Paris), F. Bottazzi (Naples), Ernst Brücke (Innsbruck), Alfred Clark (Edinburgh), E. de Burgh-Daly (Birmingham), Gustav Embden (Frankfurt-am-Main), Carlo Foa (Milan), J. Gautrelet (Paris), H. Handovsky (Göttingen), Heron (Montpellier), C. Heymans (Ghent), R. Hoerber (Kiel), B. A. McSwiney (Leeds), Nagai (Tokio), A. Tscherman-

Seysenegg (Prague), E. Waldschmidt-Leitz (Prague), and H. Winterstein (Breslau).

Two days were spent in Montreal, where the visitors were entertained by the Province of Quebec, the City of Montreal, McGill University, and the University of Montreal. The return to Europe was made on the *S.S. Doric*, which sailed on September 4th.

The next International Congress will convene in 1932, in Italy, probably either at Rome or Milan.

The International Council of Nurses

The Sixth General Congress of the International Council of Nurses was held in Montreal during the week beginning July 7th. There was a total registration of 6,213 nurses, 3,034 coming from the United States, 2,822 from Canada, and 357 from other countries. In all, thirty-four nationalities were represented. The Congress was under the general presidency of Miss Gage, who received many encomiums for the able way in which she conducted the meetings.

Addresses of welcome were extended on behalf of the Governor-General and the Government of Canada, the City of Montreal, McGill University, the University of Montreal, the Canadian Medical Association, and the Canadian Nurses Association. Telegrams of greetings were received from H.R.H. Princess Arthur of Connaught, State Registered Nurses of England, from Mrs. Bedford Fenwick, founder of the Council, and from Miss Mary Agnes Snively, the founder of the Canadian Nurses Association.

Five nations, Brazil, Greece, Yugoslavia, Sweden, and the Philippines, were received into membership. A delightful feature of the gathering was the presence of Mrs. Rebecca Strong, one of the first Scottish nurses, who, in spite of her eighty-six years, had made the journey from Glasgow to Canada in order to attend the Congress. Mrs. Strong briefly addressed the assembly, emphasizing the value of education.

Several gentlemen were present by invitation and gave addresses. These were Professor G. B. Roatta, of Florence, who spoke in the Public Health Section on "Developments in public health nursing"; Professor Julius Tandler, of Vienna, who spoke on "The scientific method in social and health work"; Dr. Stanley Ryer-

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son, of Toronto, on "The preparation of a curriculum"; Dr. Charters, from the United States, on "Trends and developments in vocational education"; Mr. S. P. Davies, New York, on "A community program in mental hygiene"; and Hon. Dr. Manion, on "The interdependence of nations."

One of the special features of the gathering was a trip to Ottawa, through the courtesy of the Canadian Pacific and Canadian National Railways.

Many topics were discussed. Chief among them were: the education of nurses, the nursing curriculum, legislation affecting nurses, mental hygiene, social service, private duty nursing. In appraising the general value of the congress, the special sub-committee of the committee on the program remarks, rather naively, "It seems to this committee an extremely significant fact that out of thirty meetings at this Congress only one was devoted to the actual practical nursing care of the patient. For one hour and a half, out of approximately seventy-five hours of meetings, the delegates studied new devices and adaptations in the bedside care of the sick. The only redeeming feature of the situation was that the auditorium where the demonstrations were held was crowded."

The officers elected for the term 1929 to 1933 were: *President*, Mlle. Léonie Maria Chaptal, of Paris; *First Vice-president*, Miss C. D. Noyes; *Second Vice-president*, Miss Jean Gunn; *Hon. Treasurer*, Miss E. M. Musson; *Hon. Secretary*, Miss Christiane Reimann. The next Congress will be held in Paris and Brussels.

The Anti-Vivisection Movement Spreads

Nationalization of the anti-vivisection movement has been started by efforts made by Charles Fyfe, treasurer of the Montreal branch of the Anti-Vivisection Society of Canada, who has returned from a trip to Alaska taken with the Pitman Tours. At a meeting of delegates representing western centres held at Victoria, B.C., it was decided to extend the movement and that any units formed throughout the west should be affiliated with the Montreal society, which holds a federal charter. There will be two sections, eastern and western, with vice-presidents for each, and both under the Montreal presidency and treasurership.—*Montreal Gazette*, Aug. 21, 1929.

Postage Stamps

The first medical men's portraits to appear on postage stamps were those of military surgeons: Kaczowski, surgeon-general of the Polish Army in 1831, appeared on Polish stamps in 1927, and Surgeon-General W. C. Gorgas on a recent issue of the Republic of Panama.

Small-Pox in Germany and England: A Contrast

In 1928 only 2 cases of small-pox occurred in Germany, both of a mild type, as compared with 4 in 1927 with one death, and 7 in 1926 with no deaths. In England and Wales the number of cases of small-pox in 1928 was about 12,400.

Book Reviews

The Writing of Medical Papers. Maud H. Mellish-Wilson. Third edition, 184 pp. Price, \$1.50. W. B. Saunders Co., Philadelphia and London. Mc-Ainsh & Co., Toronto, 1929.

This little work by the editor of the Mayo Clinic Publications is designed to assist those who desire to write well for the medical profession, and who, accordingly, may wish to acquire the craft of writing with the least possible effort and delay. The topics considered have been reduced to the minimum, and an interesting feature of the book is the introduction of quotations from other writers by whom the various thoughts have been happily expressed. The subject matter is arranged in two parts: chapters one to seven are specifically technical; chapters eight to twenty are general.

The present reviewer, who happens also to be an editor, has perused this book with much interest, and, it may be confessed, with not a little profit. The task of a medical editor in the United States does not differ greatly from that of his Canadian brother, for the difficulties in the way of good writing are not conditioned by nationality. The advice given by Mrs. Mellish-Wilson is always helpful and to the point, and is usually sound. She quotes Dr. J. S. Billings' four rules for medical writers, which might well be engrossed in letters of gold. "(1) Have something to say. (2) Say it. (3) Stop as soon as you have said it. (4) Give the paper a proper title." In the first chapter we note the following words of wisdom. "Writers should not be too ready to follow others in the misuse of terms or words." It is, unfortunately, quite easy to be slipshod in the use of language, and at the present time, unquestionably, a conscious effort should be made to maintain the intelligibility and purity of English.

As in the case of other "style books" there is a chapter on "Don'ts," which is not to be passed over. We would like, in fact, to reproduce it *in extenso*, but

must confine ourselves to what are perhaps the most common errors. Don't say "There was no pathology in the appendix." Don't say "The patient was operated." Don't use medical slang, such as, "The acute abdomen," "The chronic appendix," "The hematogenous kidney." Don't use commonplace and overworked expressions, such as, "vast majority," "startling fact," and "the consensus (not concensus, by the way) of opinion." "Don't forget that skipping about from tense to tense—commingling past, present, and future—in one time and paragraph, has not even a Bergsonian justification. It is blasphemous, ungrammatical, and annoying." Amen. Among other errors mentioned are: *x-ray* for *roentgenological* or *radiological*; *case* for *patient*; *individual* for *person*; *tubercular* for *tuberculous*; *above* for *more than*. The plural forms of words of Latin or Greek derivation provide many pitfalls. Thus, *prodroma* is a plural form and should not be replaced by *prodromata*; *data* is plural, and, therefore, should only be used with a verb in the plural; *phenomena* is plural, so that a *phenomena* is inadmissible. Nor will *vocal fremitu* pass muster. *Alright* is not all right.

A useful tabulation of adjectives with variant endings is found on page 56. There is a marked tendency in American medical publications to shorten adjectives which are commonly spelled by English authorities with the termination *-ical* to *-ic*. If it is earnestly desired to shorten such words it may, doubtless, be justified in many cases, but it should not be overlooked that, not infrequently, the two endings connote different ideas. Mrs. Mellish-Wilson mentions some of these. Thus *alphabetic* means "pertaining to an alphabet;" *alphabetical* means "in the order of the letters of the alphabet." A similar case is *historic* and *historical*. Mrs. Mellish-Wilson gives *microscopic*, but might also have given *microscopical*. *Microscopic* has relation to the microscope; *microscopical* means "of a size so small as to require the use of a microscope." We should like also to have had her views on "proven" for "proved" and "technic" for "technique." Under the heading Usage

VACCINATION AGAINST DIPHTHERIA

For the five-year period 1920-25 in the Province of Ontario, *one death in every six* among children between 2 and 14 years old was due to diphtheria.



The majority of deaths from diphtheria occur during the months of the school year.



Diphtheria may be prevented by the use of Diphtheria Toxoid (Anatoxine-Ramon).



Diphtheria Toxoid as developed by Ramon of the Pasteur Institute, Paris, results from the incubation of diphtheria toxin with formaldehyde. It is a particularly stable, accurately standardized antigen which is *absolutely non-toxic*. It contains no serum and is therefore incapable of inducing sensitization to anti-toxins or sera.



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of Words lists of words often used and of words to be preferred are given. We cannot follow the author's practice here in every case. *Chronic interstitial nephritis* is not the equivalent of *Bright's disease*; the latter expression connotes, certainly, much more than the former. It is not often that it is desirable to affix a personal name to a disease, but this is one of the cases where it seems to be an advantage. When used in an adjectival sense we prefer *round-celled* to *round-cell*.

Bibliographical references should be exact, complete, and set down in accordance with standard practice.

The book is concluded by a complete list of standard abbreviations for the names of medical journals, and an excellent index.

We know of no better book for its purpose than Mrs. Mellish-Wilson's "The Writing of Medical Papers."

A. G. NICHOLLS

Practical Materia Medica. Clayton S. Smith, Ph.D., M.D., and Helen L. Wikoff, Ph.D. 300 pages. Price \$3.25. Lea & Febiger, Philadelphia, 1929.

Drugs are dealt with according to their composition under the main divisions, Inorganic and Organic, with the following chapter headings, metals, acid, non-metallic elements; the aliphatic series, the aromatic series, terpenes, carbohydrates, glucosides, fats, aliphatic compounds containing nitrogen, alkaloids. Part three is devoted to toxicology and part four deals with prescription writing.

The authors are more interested in chemistry than in physiology. Instead of definitely and clearly stating the physiological action of the drug under discussion and letting the student or the practitioner judge for himself whether he will use it or not, they make statements such as "Uva ursi is used almost exclusively in the treatment of catarrh of the urinary tract, especially acute cystitis. Formerly it was employed in the treatment of gravel, nephritis, urethritis and menorrhagia, but its use for these conditions has largely been abandoned. Uva ursi probably owes its antiseptic action to the formation of hydroquinone which results from the hydrolysis of arbutin in the body." Again "Numoquin base, a proprietary remedy is synthesized from quinine. Its use has been recommended in the treatment of lobar pneumonia." Some experimental or clinical evidence should have been adduced to support this statement. Again, "codeine is used in expectorant mixtures and to allay intestinal and pelvic pains." Many do not confine its use to effects on these areas.

Is not the placing of questions after a chapter, as these authors have done, an admission of belief that the instructor lacks the intelligence to frame his own?

The antidotal treatment of poisons is clear, concise and practical; to the practitioner this section will be the most useful; the medical student will find it a concise reference book, but will need a fuller text for the complete story of what drugs do.

LILLIAN A. CHASE

Report on Fourth International Congress of Military Medicine and Pharmacy, Warsaw, Poland, May-June, 1927. William Seaman Bainbridge, M.C.F., United States Naval Reserve. 248 pages, illustrated. The Collegiate Press, Menasha, Wisconsin.

This is an official report of the Congress held at Warsaw, Poland, in May and June, 1927. Meeting every second year, the fifth Congress has been in Session in London, England, during May, 1929, and has been reported in the *British Medical Journal* of May 18.

At the Warsaw meeting, thirty-one countries and the Red Cross were represented by about 225 official delegates, and discussed were Evacuation in Moving

Warfare; Etiology and Prophylaxis of Influenza; Sequelæ of Traumatism of the Skull; the Arsenobenzols, their chemical determination; and Organization of Dental Services. The volume of proceedings, as reported by the official representative of the United States, is a valuable addition to the literature of Military Medicine.

J. H. ELLIOTT

Tuberculous Intoxications. Concealed and Masked Tuberculosis. Joseph Hollis, M.D. 132 pages. Price \$3.00. Edinburgh, E. & S. Livingstone. Toronto, Macmillan Co. of Canada, 1929.

In this small volume the author describes many and varied vague symptoms which he believes are caused by the toxic absorption from old standing and seemingly inactive tuberculous foci. Among the various symptom-complexes he notes those characteristic of neurasthenia, rheumatism, neuralgia, thyrotoxicosis and also many disturbances of the digestive and genito-urinary systems. His chapter on immunity to tuberculosis is of interest. He lays particular stress on two observations, *viz.*, "Hereditary immunity plays a large rôle in decreasing the intensity of the tuberculosis which may affect generation after generation," and "There is actually a tendency toward tuberculosis in everyone descending from parents free from tuberculosis." Be this as it may, he cites numerous case reports to illustrate his observations and theories.

Dr. Hollis combats these intoxications by means of tuberculin and immune blood. The latter he administers either hypodermically or by inunction in dilutions as high as 1-10,000.

He obtains his immune blood by the inoculation of rabbits with cultures made from the tuberculous sputum, and uses the washed and subsequently hemolyzed red cells.

A. H. MACCORDICK

Percussion of the Chest. J. B. McDougall, M.D. H. K. Lewis & Co., London, 1929. 6/- net.

This book might be regarded as an attempt at presenting percussion of the chest "in extenso". The subdivisions are entitled as follows: I. Historical. II. The Technique of Thoracic Percussion. III. The Acoustic Aspect. IV. Variations in the Percussion Note in Certain Diseases of the Chest.

The historical survey includes the epoch-making contribution of Auenbrugger's in 1761, the revival of the art of percussion by Corvisart in 1808 and the improvements in technique brought about by Piorry, Skoda, Goldscheider and others.

In the section on the technique of thoracic percussion there is a strong plea for light percussion. This chapter is of especial value to the teacher and student as it contains many practical clinical suggestions.

The third part, the acoustic aspect, classifies the sounds heard on percussion and describes completely the constituent parts of the sounds, *viz.*, intensity, duration, pitch and quality.

Finally the author links up the common clinical thoracic lesions with this important everyday method in physical diagnosis. There is an extensive bibliography from which the author has made numerous citations.

The author has limited himself entirely to the subject and perusal of the book will well repay those interested in clinical medicine.

W. R. KENNEDY

Recent Advances in Psychiatry. Henry Devine, O.B.E., M.D., F.R.G.P. Pages 340. P. Blakiston's Son and Co., Philadelphia, 1929.

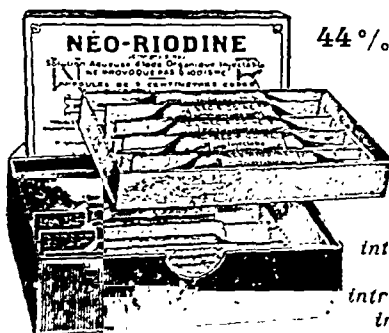
This is a welcome review indeed if for no other reason than that a cursory glance at the table of

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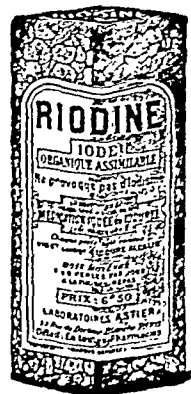
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her husband, the late Professor Boveri, of the University of Wurzburg, which presents the possible bearing of his profound studies of distorted nuclei on the cancer problem. Boveri was a master in the field of cytology. In approaching the problem of the origin of malignant tumours, he assumes that the qualities of the malignant cells have their origin in a defect which exists within them, not in a disturbance of protoplasm, but in a disturbance of the nucleus which prevents the return of the cell to the normal condition. Further, he affirms that "such nuclear defects might pass as harmless, if, as was formerly believed, all chromosomes of the nucleus were essentially of the same value." The essence of his theory is that the cause lies not in abnormal mitosis, but in a definite abnormal chromosome complex. The theory is advanced and supported by years of careful investigation.

The translation of this classic in cancer research, and its publication as a very attractive small book of one hundred and nineteen pages, render it readily available to English-speaking physicians and students. It is stimulating alike to the research worker and the practitioner, and will be read with real interest and profit by everyone who is interested in the cancer problem.

R. D. DEFRIES

Clinical Electrocardiograms. Frederick A. Willius, M.D. 219 pages, 368 illustrations. Price \$8.00. London & Philadelphia, W. B. Saunders Co. Toronto, McAllin & Co., 1929.

This is a practical handbook of electrocardiography for students and clinicians who would like to begin the study of this subject. Electrocardiograms illustrating abnormalities of cardiac rhythm and conduction are arranged in orderly fashion and described in a didactic manner. More than half of the 219 pages are occupied by reproduction of electrocardiograms; there are many pages of bibliography; and the remaining relatively small space is devoted to the text. In reading the book one imagines the author, seated in his laboratory, demonstrating to a clinician interested in the given case, but ignorant of electrocardiography, the points to be noted in the record and their clinical significance. Inasmuch as the author has adhered to the principle of brevity, the book is very good, but frequently one meets deficiencies that might have been made good by the addition of but a single sentence or phrase to a given paragraph or page. Thus in discussing sinus arrhythmia the sentence "A slight acceleration of rate occurs during inspiration and a slight retardation during expiration," would be made more comprehensive if to it were added "*or vice versa*". The few sentences devoted to the description of circus movement are very effective, but a simple diagram would help the beginner very much in appreciating their meaning. In the text on premature contractions there are two sentences which might sometimes fail to be in agreement with direct observations. "The beat which occurs prematurely is always followed by a pause, variable in length, which endures until the occurrence of the next beat of the normal cardiac rhythm. This period is known as the compensatory pause." For the usual ventricular premature contractions this is true, but after interpolated beats and in many instances following auricular premature contractions there is no "compensatory" pause, the diastolic period being abbreviated in the former instance and of normal shortened or slightly increased duration in the latter.

The statistical table in which the author analyzes the clinical significance of changes in the T-wave are very interesting and valuable. The records of the five cases of coronary thrombosis shown in chapter XV are very instructive, and those of the dying human heart in the final chapter help to visualize the phenomena which physicians usually observe with the stethoscope. In virtue of the excellent electrocardiograms and the

simple directness of the text this book is very suitably adapted to serve its purpose.

H. N. SEGALL

Old Age and Minor Involution. Aldred Scott Warthin, Ph.D., M.D., LL.D. 200 pages, 29 illustrations. Price \$3.00. Paul B. Hoeber, New York, 1929.

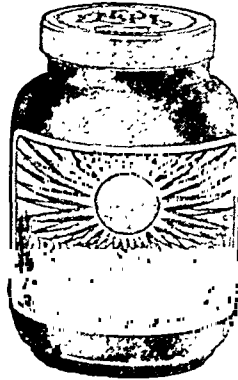
This latest volume on "Old Age", that familiar subject of curiosity and study, is from the pen of one of America's leading pathologists. The great interest aroused by Dr. Warthin's lecture on the "Pathology of the Aging Process" in 1928, led to the writing of this book. The author has had thirty-eight years of experience as a pathologist yet he has seen not more than twenty cases of death due to senility *per se*. Nevertheless the main theme of his treatise is that old age is a physiological phase of the span of life, and not a disease as some have claimed. The argument is lucidly developed.

Our present knowledge of the development of animal organisms makes it apparent that processes of involution are as necessary as those of growth in the "building plan" of the animal. The involution and disappearance of the tail of the spermatozoon, after it has fulfilled its function as the organ of locomotion for nucleus which fuses with the ovum, is one of the earliest involutions in the development of the animal. Then, during embryonic life, the appearance and disappearance of such organs as the gill-slits, the thyroglossal duct, the Wolffian body, and others that are completely enumerated are further examples of evolution and of involution going on simultaneously within the body. The author applies the name "Minor involutions" to these and others which occur during the phases of development from the germinal period to early adult life. Old age he terms the "Major involution."

The time of onset of old age varies widely in different individuals. With a natural proclivity for detailed description, the author enumerates the many changes in the appearance and behaviour of human beings which characterize old age. Two chapters are devoted to the description of histological changes in the tissues that typify the processes of the major involution. Another chapter deals with the diseases which usually occur during old age; carcinoma, though it is one of these, is not necessarily due to an involutionary process, but is considered to be dependent upon a "pathologic anomaly of constitution."

In discussing the various theories and conceptions of the mechanism of involution in old age, the author commits himself to the belief that "old age, the major involution, is due primarily to the gradually weakening energy charge set in action by the moment of fertilization and is dependent upon the potential fulfillment of function by the organism. The immortality of the germplasm rests upon the renewal of this energy charge, from generation to generation." In these two sentences Dr. Warthin epitomizes his conception of old age. The limit of time allotted to the human being is about one hundred years, and although some exceptional cases of longevity have been recorded, Dr. Warthin firmly believes that there are no grounds for hoping that this limit may be greatly extended. The expectation of life may be increased beyond its present average of 54.05 years for white males and 56.41 for white females, but that is another matter. Rejuvenation of the senile individual, in the sense of certain contemporary claims, is not possible. Old age is inevitable, but it can be made a relatively comfortable and happy phase of life. Intellectual functions continue to be satisfactorily active after the physical strength of the body has reached a rather low level. By cultivating intellectual hobbies one may find happiness during senescence and senility. The concluding chapter on the "Philosophy of Old Age," contains much good advice on the art of growing old gracefully.

H. N. SEGALL



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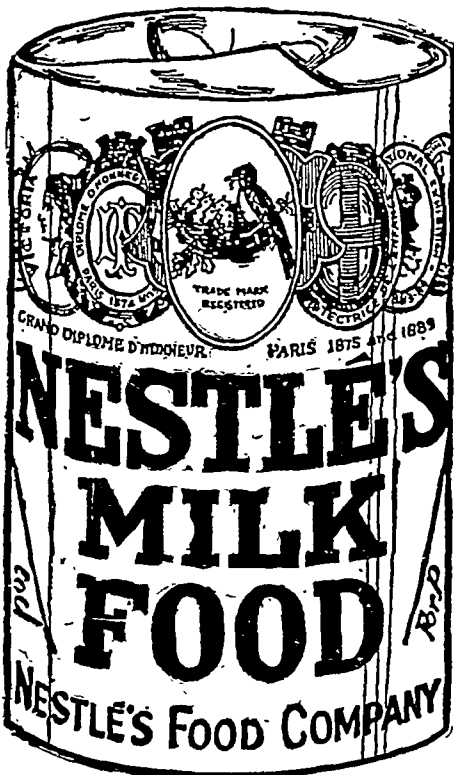
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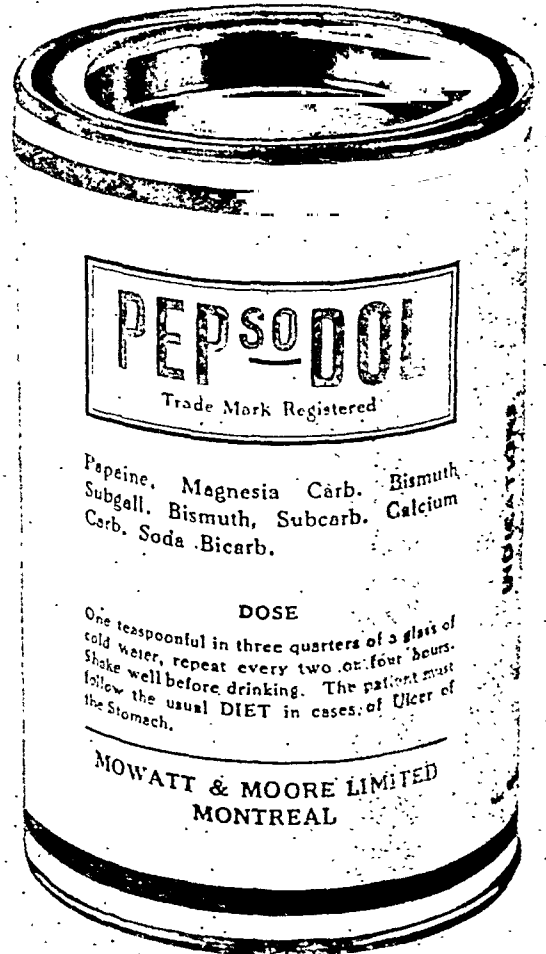
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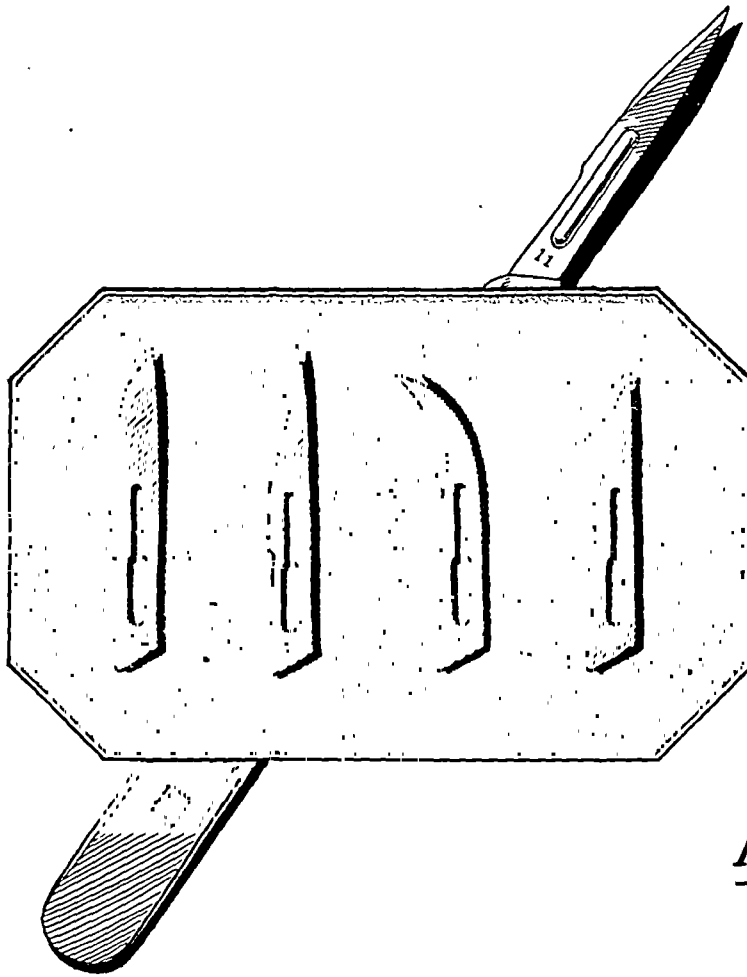
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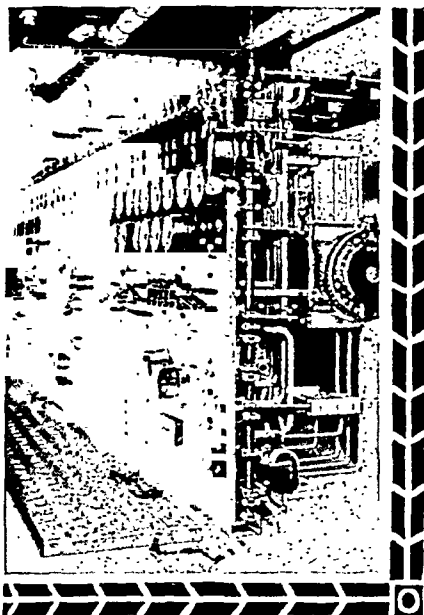
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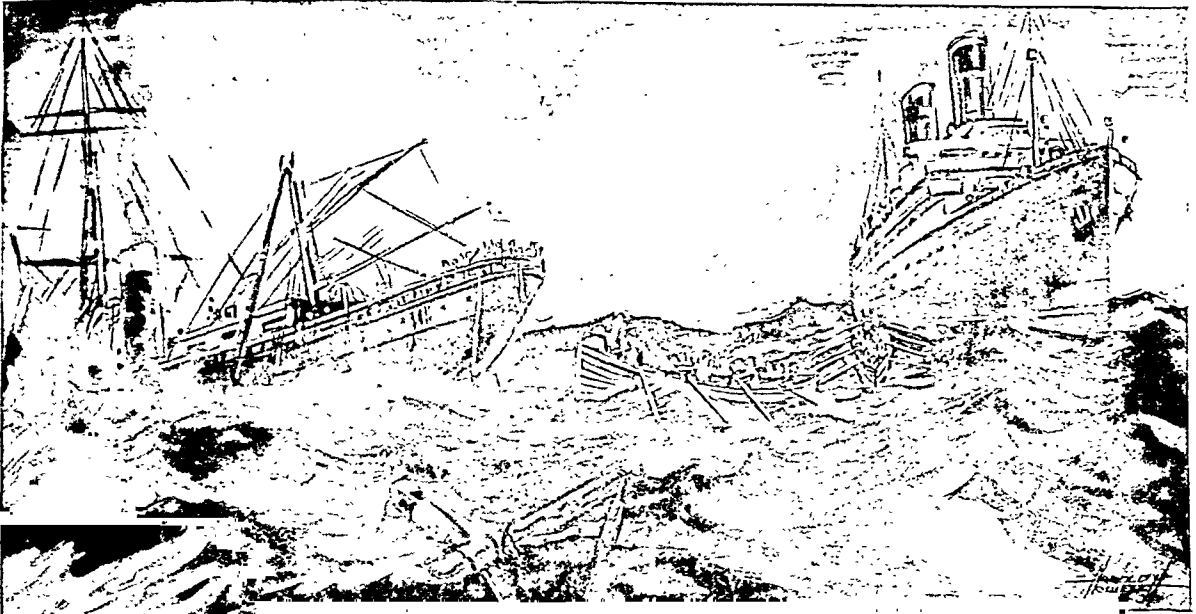
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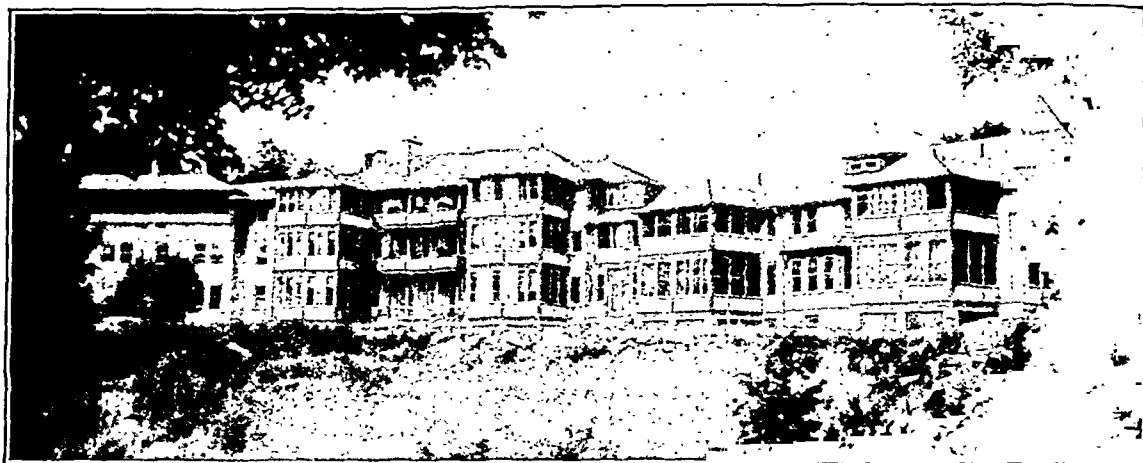
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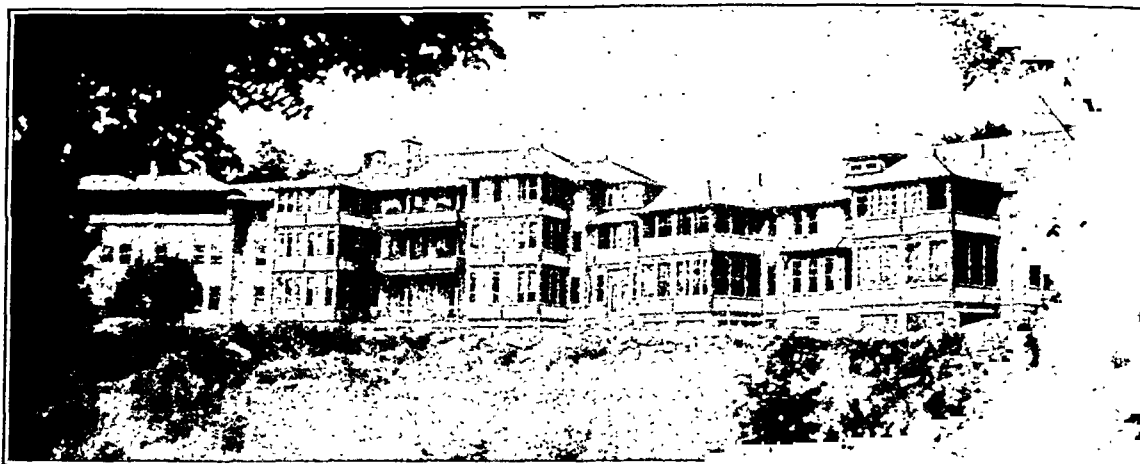
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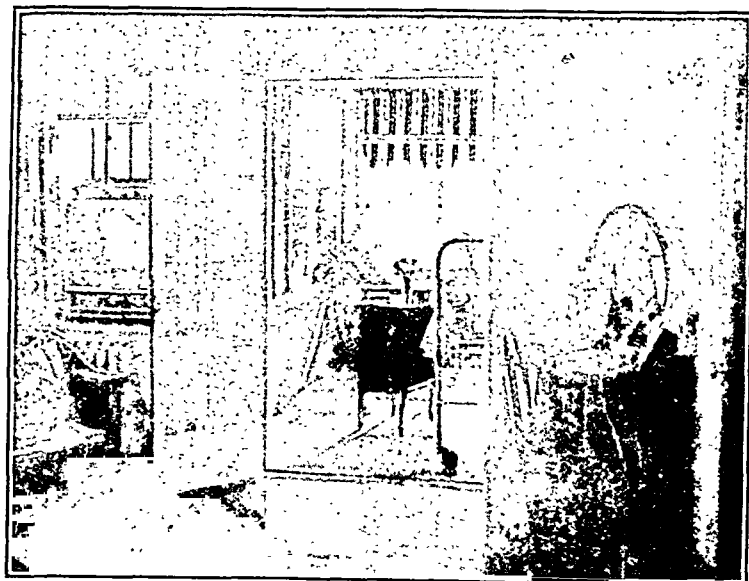
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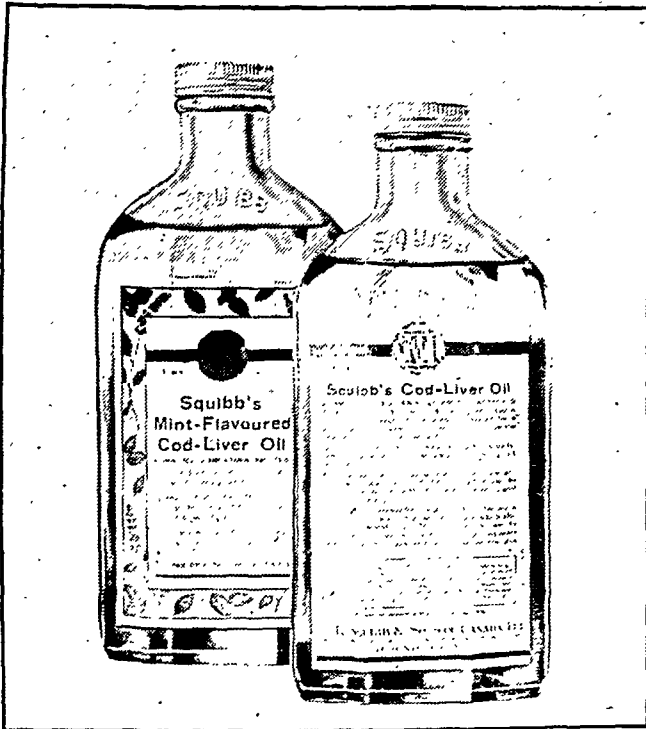
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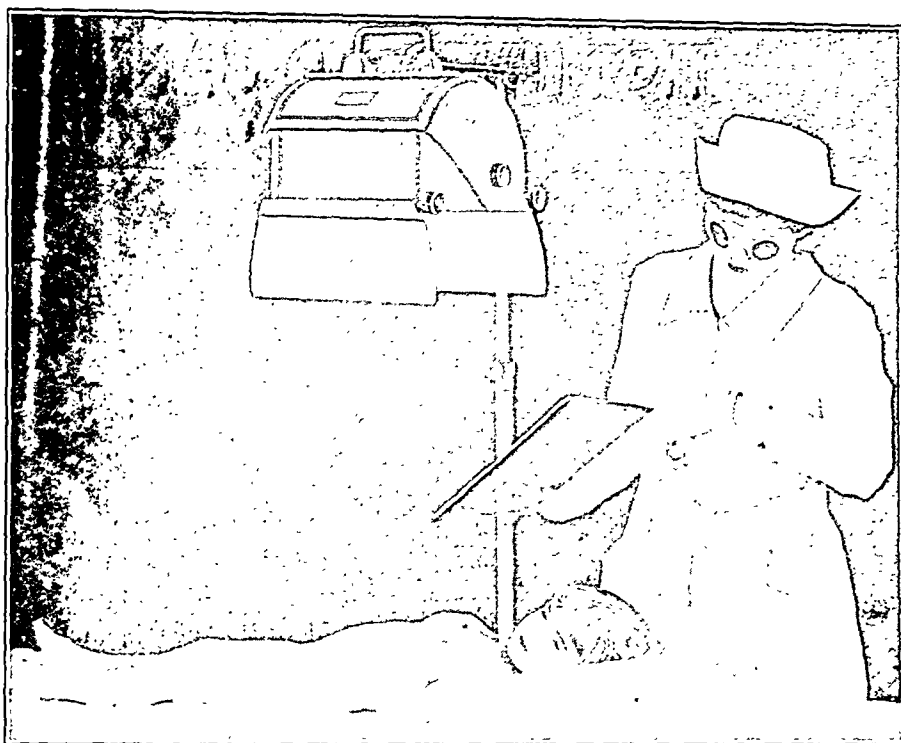
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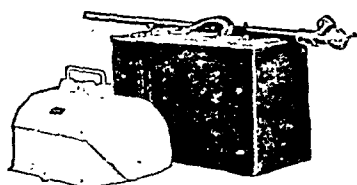
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Gynaecology	Oct. 4 to Oct. 26—Chelsea Hospital for Women. Mornings and/or afternoons. Fee £5 5s. Od.
Diseases of the Throat, Nose and Ear	Oct. 14 to Nov. 2—Central London Throat, Nose and Ear Hospital. All day. Fee £5 5s. Od. (Practical Operative Class £7 7s. Od.) (Endoscopy and Pathology Classes).

NOVEMBER

Ante-Natal	Nov. 1 to Nov. 22—Royal Free Hospital. Fridays at 5.0 p.m. Fee £1 1s. Od. (limited to 10).
Medicine, Surgery, and Gynaecology	Nov. 4 to Nov. 23—Royal Waterloo Hospital. Afternoons and some mornings. Fee £3 3s. Od.
Venereal Diseases	Nov. 4 to Nov. 30—London Lock Hospital. Afternoons and evenings. Fee £2 2s. Od.
Neurology	Nov. 18 to Dec. 13—West End Hospital for Nervous Diseases. Daily 5 p.m. Fee £2 2s. Od.
Proctology	Nov. 25 to Nov. 30—St. Mark's Hospital. All day. Fee £3 3s. Od.
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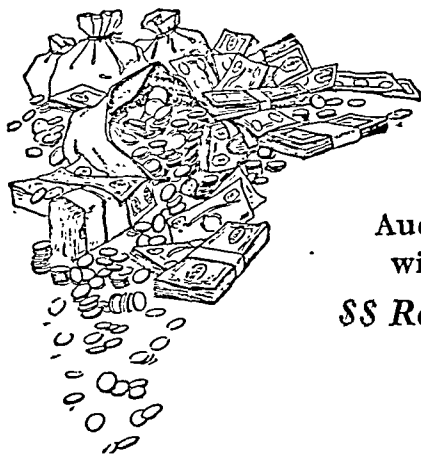
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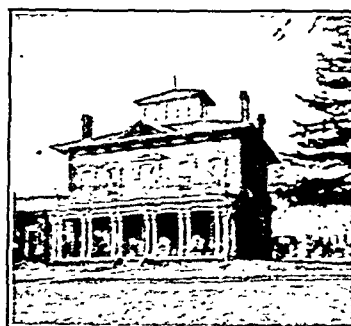
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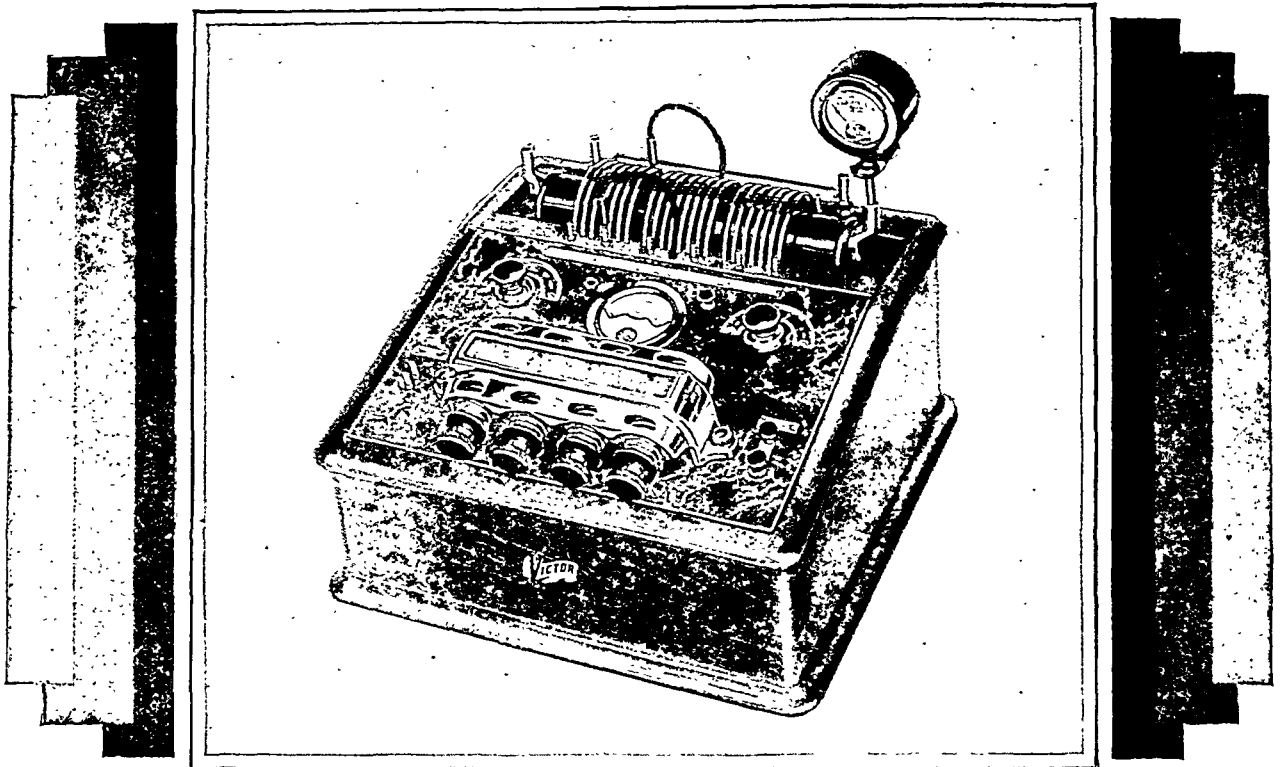
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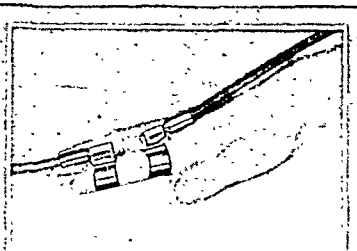


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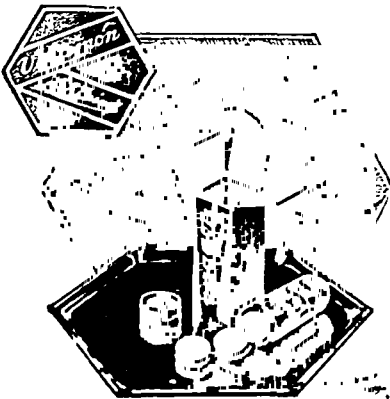
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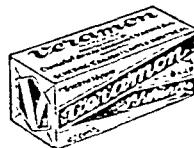
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(Irradiated Ergosterol in Oil)

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The urgent need for ionizable calcium in pregnancy due to the demands of the growing fetus, suggests the systematic use during this period of a medicinal agent capable of influencing calcium metabolism. Such an agent is Viosterol, P. D. & Co., standardized to an antirachitic (Vitamin D) potency one hundred times that of high-grade cod-liver oil.

The need for such support continues after birth, to assist the bony growth of the child. Not only may Viosterol, P. D. & Co., be given to the infant, the effective dose being very small, but also to the nursing mother to enhance the bone-building value of her milk.

It is true that vitamin D does not add to the store of calcium in the body, but it does most decidedly stimulate the synthesis of bone by bringing together for organic union its essential elements, calcium and phosphorus.

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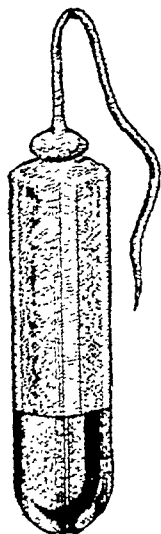
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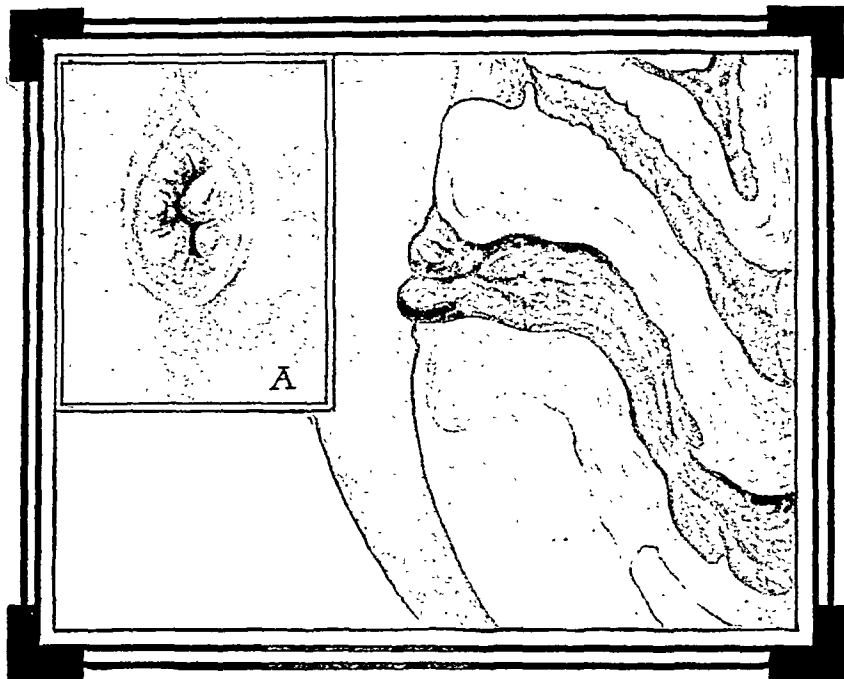
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IRRADIATED MUFFETS

THE discovery by Dr. Harry Steenbock of the University of Wisconsin that food stuffs can be imbued with the anti-rachitic vitamin "D" through *irradiation* with ultra violet light, is regarded as one of the greatest contributions to nutritional science.

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The vitamin "D" potency of Irradiated Muffets is not that of a pharmaceutical preparation—but a "dash of sunlight" made available at a time when sunlight itself, the progenitor of vitamin "D", is not constantly and adequately available.

The ribbons of whole wheat, toasted to a crisp brown under the most sanitary conditions, are also a rich source of wheat protein, roughage (bran), and in addition they are imbued with vitamin "D"—the sunlight factor of nutrition. A biological assay of the vitamin "D" in Muffets gives the following percentage of bone ash as compared with an ordinary cereal of the same chemical constitution:

Unirradiated wheat:	30.7
Irradiated Muffets:	56.2

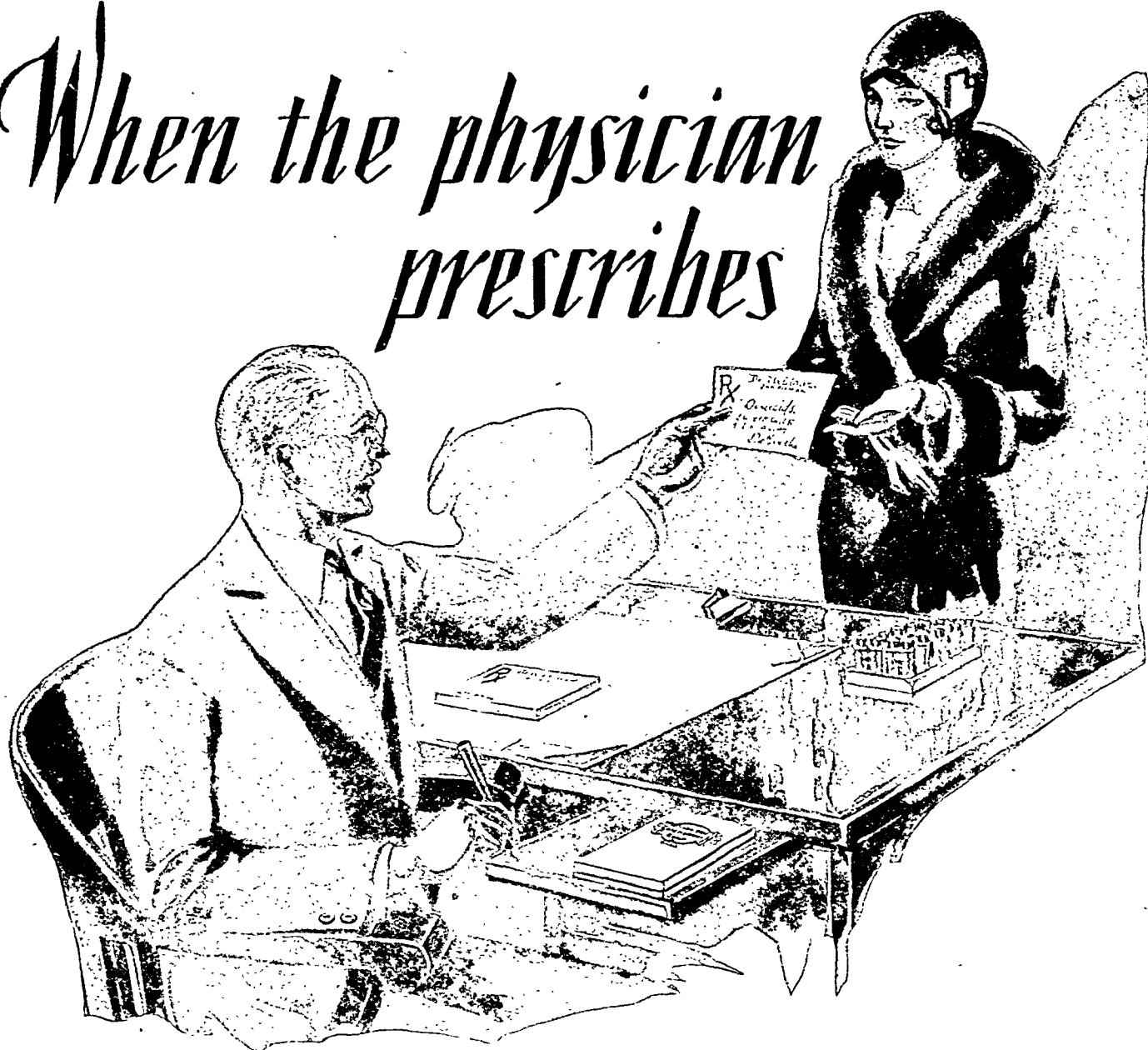
Elaborate tests for storage and cooking have been conducted under the direction of Dr. Steenbock. They show that there is no loss in vitamin "D" content in Muffets stored under ordinary conditions for eighteen months.

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Ovacoids Ampacoids Testacoids

in the various sex gland dysfunctions in women and men, he is utilizing the autacoids or hormones of the glands presented in highly concentrated form. These products represent a new principle in the treatment of gonadal deficiencies.

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AMPACOIDS Ovary, Prostate and Testicle are sterile aqueous solutions of the particular gland, and can be used independently from three to seven times weekly, or in conjunction with Ovacoids and Testacoids.

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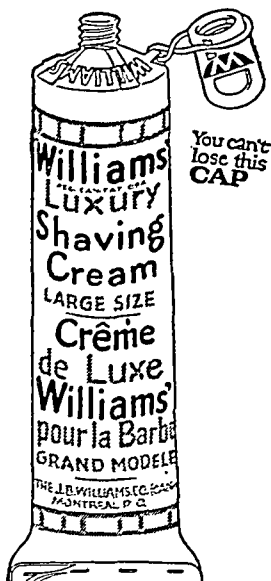
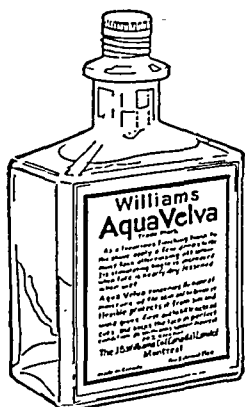
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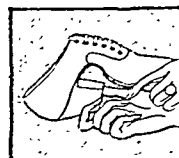
For this reason, more and more physicians are recommending to their patients the Cantilever Shoe. The comfort of this shoe makes the patient ready to follow your instructions regarding exercise, and the corrective features, relieving the ills that arise from weakened and distorted feet, definitely assist your treatments. Their orthopedic features include the flexible shank, which comfortably supports the arch in proper position while allowing all the muscles of the foot to exercise; the natural shape, which gives full foot-room; and the correctly designed heel, which gives proper posture. All these points have the approval of prominent physicians.

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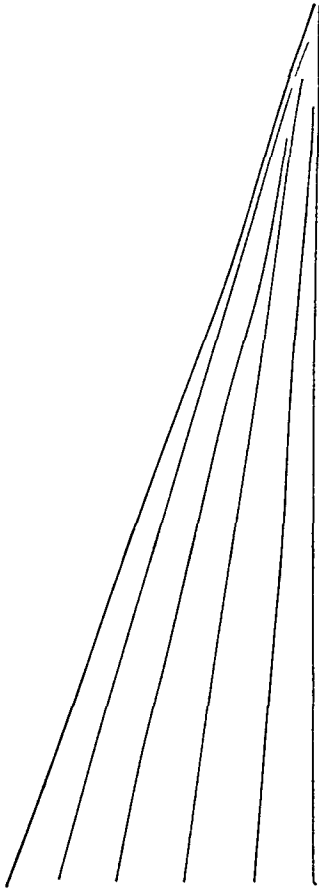
ALL-BRAN is a delicious cereal with milk or cream, with fruit or honey added. When included in muffin, waffle and griddle cake batter it adds the bulk these popular hot breads lack.

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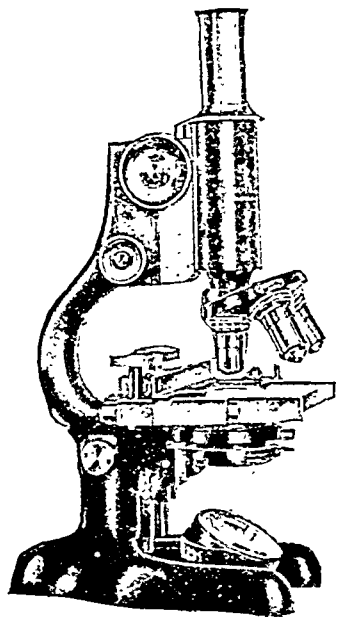
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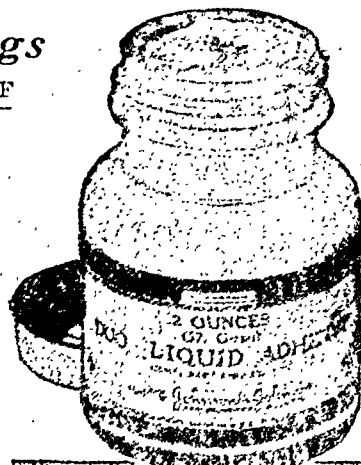
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Vol-21, NOV. 1929 NO-5 (NOV.)

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Acting Editor, A. G. NICHOLLS, M.A., M.D., D.Sc., F.R.S.C.
3640 University Street, Montreal

Vol. XXI

NOVEMBER, 1929

No. 5

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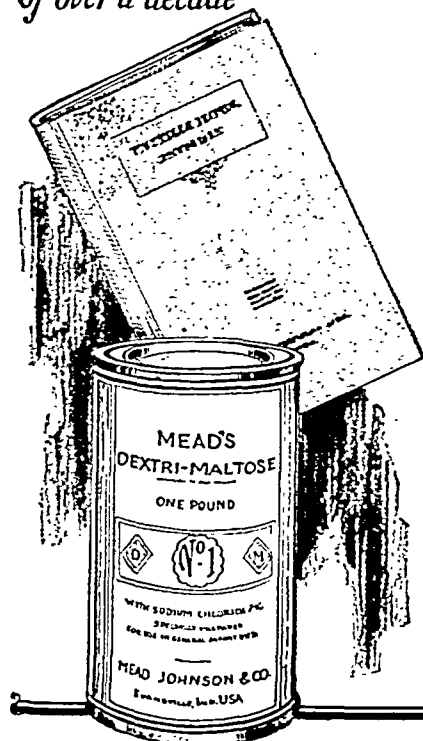
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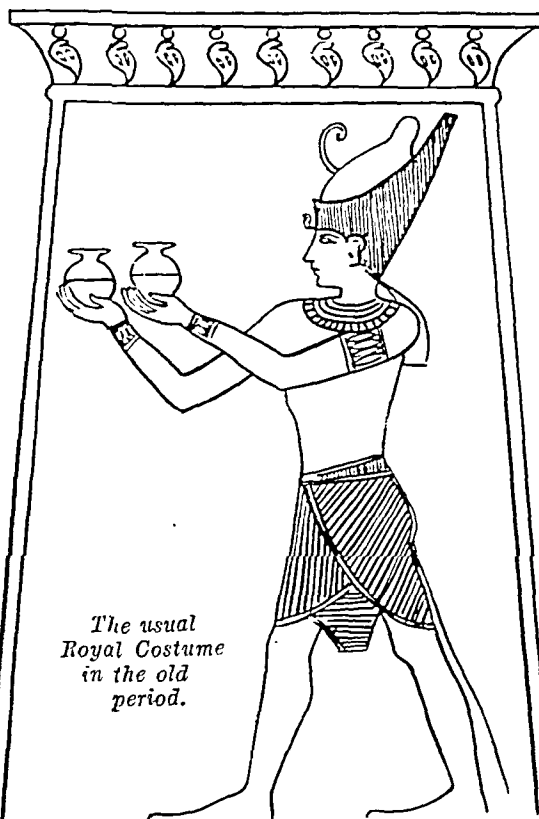
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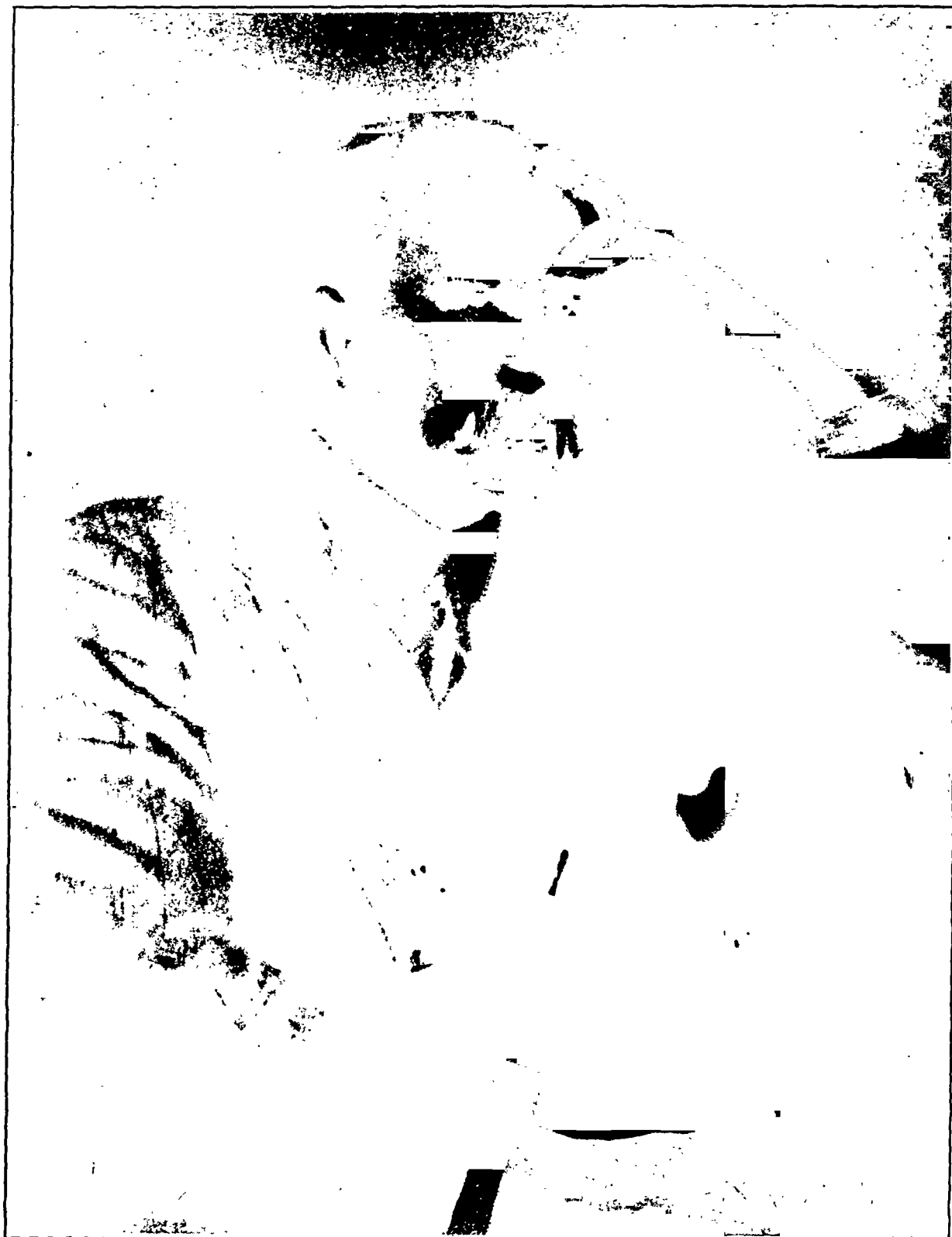
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SIR WILLIAM OSLER, Bart.

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THE OSLER MEMORIAL CELEBRATION

IN one respect, at least, the annual meeting of the Canadian Medical Association, recently held in Montreal, differed from its predecessors. For the first time the memory of Canada's greatest physician was officially honoured by having a special day set aside, which was called "Osler Day." On that day the Osler Library in the building of the McGill Medical School, with its great treasures, was open to inspection, and in an adjacent room and in the Reading Room of the Medical Faculty Library there was a most interesting display of "Osleriana," consisting of rare books, photographs, association articles, and a collection of specimens of morbid anatomy, collected by Osler, notably aneurysms, and cases of endocarditis, the latter of which afforded him the material for his Goulstonian Lectures.

It is impossible to deal adequately with the books on exhibition in the small amount of space available to us, but a few works of special interest and importance may, perhaps, be referred to.

Among the Incunabula were the Venetian edition of Lucretius' *De rerum natura* (1495), of which Osler said that the famous "tellus dura" passage could be transferred to any modern textbook of anthropology. There was the great Aldine edition of Aristotle of 1495. There was the Florentine text of Celsus, of 1478. The first work written on the diseases of children, that of Bagellardus (1472) was there. Among other early works were the Venetian edition of Hippocrates (1526); The editio princeps of Euclid (in Greek), of 1533; the *Bibliotheca Universalis* of Gesner (1545), the first published work of bibliography; the work of Copernicus, dealing with the macrocosm for the first time in a scientific way, and the *De Humani Corporis Fabrica* of Vesalius, concerned with the microcosm, also for the first time scientifically, both of which books, curiously, appeared in the same year, namely, 1543; Harvey's Letters to Riolanus, (1649), the rarest of Harvey items; the first edition of Harvey's epoch-making work, the *De*

motu cordis (1628); Gilbert's *De Magnete* (1600), the first truly scientific book to be published in England, a book which established the fact of terrestrial magnetism and laid the foundation of the modern science of electricity. Jenner's treatise on Vaccination, the first edition (1798), another rare work, was also there. The special "points" of all these treasures were explained by the Librarian, Dr. W. W. Francis.

In the evening the members of the Association, their friends, and invited guests were assembled in force in the Windsor Hall to listen to the first "Osler Oration."

About a year ago a movement took shape to honour in some fitting way the memory of Sir William Osler. An oration, to be delivered triennially by some outstanding man, Scholarships, and, perhaps, Fellowships, were to be established, it was hoped. To this end a campaign for funds has been going on quietly. Something has been done, but much remains to be accomplished.

It was thought that, inasmuch as Osler was a student and professor at McGill University, and that the Sixtieth Annual Meeting of the Canadian Medical Association was this year to be held in Montreal, it would be entirely fitting to call upon one of the local men, one who had been, in the past, closely associated with Osler, to deliver the first Osler Oration. The choice fell upon the late Dr. Francis J. Shepherd, formerly Dean and Professor of Anatomy at McGill University, and a close friend of Osler's. It is much to be regretted that the death of Dr. Shepherd, which we greatly deplore, prevented his delivering his oration in person. However, he left his manuscript almost complete, and the duty of reading it was entrusted to Dr. H. A. Lafleur, another close associate of Canada's greatest physician.

The Osler Oration was delivered on June 20th, before a large audience. Dr. A. T. Bazin, the President of the Association, was in the chair, and with him on the platform were Dr.

Heurner Mullin, Chairman of the Osler Memorial Committee; Dr. Campbell Howard, Chairman of the Provincial Committee for Quebec; Dr. B. G. Bourgeois, President of the Province of Quebec Medical Association; and three Deans, Dr. C. F. Martin, of McGill University; Dr. L. deL. Harwood, Université de Montréal; and Dr. Arthur Rousseau, of L'Université Laval; and Dr. Henri A. Lafleur. A fine oil painting of Sir William Osler, loaned by McGill University decorated the platform.

The Chairman's remarks, which were brief, contained an interesting announcement. Dr. Bazin spoke as follows.

“HONOURED GUESTS, LADIES AND GENTLEMEN :

Six years ago, to celebrate the centenary of the birth of Joseph Lister, the father and founder of Antiseptic Surgery, the Canadian Medical Association raised a fund of \$5,000.00 by subscription from among its members for the purpose of establishing a “Lister Memorial Oration.” The capital is set aside in a “Trust Fund,” invested in trust fund securities and the interest allowed to accumulate. Every three years the interest is used to defray the expenses of preparation and travel of an orator of eminence chosen to address the Association on some important subject of surgery.

The inauguration of the Lister Oration was held at the Ottawa meeting in 1924, the speaker being Dr. John Stewart, of Halifax, one of Lister's house-surgeons. The second address was given at the Toronto meeting in 1927, the speaker being Sir Charles Sherrington, of London, England.

Last year, a committee was formed to raise in like manner a similar sum to establish a Triennial Oration in honour of Osler. The inaugural address will be delivered to-night.

But inasmuch as Osler was one of us, a Canadian by birth and by education; inasmuch as he did his first clinical work in Canada and laid therein the foundation of his masterly book “The Practice of Medicine,” the Osler Committee considers that more should be done to honour and perpetuate his name in Canada than a Triennial Oration presented before the annual meeting of the Canadian Medical Association. To this end the formation of Osler Societies is encouraged both among graduates and undergraduates in Medicine; Osler Scholarships are projected to be awarded to candidates nominated by the Faculties of Canadian Medical Schools or other responsible bodies, to permit of special study to advance medical knowledge or to improve the teaching of clinical medicine.

As Osler was a graduate of the McGill Medical School, as Montreal was the scene of his first clinical and teaching success, it is appropriate at this Montreal meeting not only to inaugurate the “Osler Memorial Address” but to announce that the two medical institutions of this city with which he was connected are to benefit from the establishing of “Osler Scholarships.” A sum of \$6,000.00 has been generously donated to the Canadian Medical Association by Mr. J. W. McConnell. This money will be a “Trust Fund,” will be invested in trust fund securities, and the interest accumulating over three years will be available to a candidate nominated by the Faculty of Medicine of McGill University, to permit such candidate to undertake such special studies as will make him or her better fitted to teach Clinical Medicine. As the Montreal General Hospital was Osler's first hospital, the President and five members of the Board of Management have donated a like sum under similar conditions, the candidate for the Scholarship to be nominated to the Canadian Medical Association by the Medical Board of that hospital.”

Dr. Lafleur acquitted himself of his difficult task in a highly satisfactory way. He introduced his reading of the Oration with a few words of explanation, and concluded it with some very graceful and feeling remarks of his own. He said:—

“It is not without some reluctance that I have undertaken to present the address prepared by the late Dr. Shepherd for this occasion. No one can have quite the same feelings for an adopted child as for one's own flesh and blood, and it is not easy to show in its right perspective and its proper light, a portrait painted with another's brush and palette.

The selection of Dr. Shepherd to deliver the first Osler Oration before the Canadian Medical Association was a peculiarly happy and fitting one. He was the oldest surviving close friend, fellow student, and colleague in teaching during Osler's formative years at McGill—possessing an intimate personal knowledge of his earlier years in the profession, and a genuine appreciation of the man as well as of the physician. None other, if we except the late Dr. Geo. Ross, was equally fitted to do justice to this period of Osler's life.

The address is admirable in detail, and full of personal memories of this early period, while the later phases are broadly sketched with a due appreciation of the salient points. The style is characteristic of the man—rugged, at times somewhat disjointed, but always forceful.

This oration is a solid foundation upon which shall be built an enduring monument to Osler—a structure of many façades, in keeping with the wide range of his sympathies and activities, forming a harmonious whole which will give as complete a picture of the man and his work as is humanly possible, and serve as a guiding-

post to future generations of those who tread the long and arduous path of medicine.

I may add that I have made only necessary verbal alterations and corrections of typographical errors in the manuscript, with occasional transposition of paragraphs. It is substantially as Dr. Shepherd wrote it."

THE OSLER ORATION*

BY THE LATE FRANCIS J. SHEPHERD, M.D., LL.D., F.R.C.S.,

Montreal

IT is difficult at this recent date to estimate the value of Osler's work and activities. So much has been written about him, and everybody who has ever spoken to him or had some slight intercourse with him has rushed into print, and given his or her experience, and has estimated his good qualities and his influence on his personality or the medical community at large, that it is hard to sift the grain from the chaff. I, who was closely connected with him as a fellow student, friend, and colleague, for fifty years, yet feel it hard to judge the effect of his work and influence on his fellow practitioners and medical confrères.

There are certain outstanding activities to which he, a man of many interests, was specially attracted: (1) the bringing together of his fellow medical men by means of societies, etc., and being a peacemaker always; (2) the establishment of medical libraries and journal clubs, and the encouragement of students to read; (3) the encouragement of medical students to pursue lines of work outside the usual college curriculum, such as medical biography and history, etc.

He was always essentially a clinical teacher, and loved to have a class following him through the wards. In fact, he came to McGill from Toronto chiefly because of the clinical advantages of the Montreal General Hospital. At that time (1870) this hospital was the only one on this continent that allowed students to work in the wards. As a student he was not a slavish attendant at lectures, nor did he take elaborate notes, as was the custom then, but he was usually to be found in the wards of the hospital or in the post-mortem room. He did not take a high place in class (for then that was taken by the man with the best verbal memory), but his thesis

on his own pathological work, illustrated by specimens, was given a special prize for originality.

His influence on students and young graduates, and his suggestion of lines of work and his encouragement in forwarding it, are well known. His presence was always an inspiration; he never failed to incite the love of his fellow workers and to make them feel that he was one of themselves. His manner was hearty and open, and his memory for individuals was marvelous. He never forgot old friends, however numerous his new ones. Wherever he went he was an element of good in that community, and his personality was soon felt. As the late Dr. R. P. Howard once said, he was a "potent ferment". Any new method of diagnosis was seized upon by him, elaborated and investigated, *e.g.*, Laveran's discovery of the malarial organism. He was one of the first to explore and confirm the discovery. He was much interested in public health, and his work in popularizing the open-air treatment of tuberculosis is well known, as is his founding of many societies for the prevention of this disease.

Osler had a great sympathy for the general practitioner, a great respect for his virtues and much knowledge of his arduous life. He seemed to feel for all his troubles and hardships, and when such practitioners visited his hospitals he paid them every attention. I have often heard him tell of what they have done and of what is due to them.

Dr. A. McNair Wilson, author of *The Beloved Physician* (the Life of Sir James Mackenzie), says (p. 182), "It was my great privilege and honour to make the acquaintance of the late Sir William Osler some years before the end of his life. I was struck, as all men were struck, with the bigness and generosity of his nature, the

* The First Osler Oration, read by Dr. H. T. Lafleur at the Annual Meeting of the Canadian Medical Association, Montreal, June 20, 1929.

goodness and sweetness of the man. I realized why Mackenzie always spoke his name with delight and affection. 'Osler', he once told me, 'came to see me when no other of the great physicians would have dreamed of coming'."

As I said before, so much has been written about Sir William Osler that it is difficult, if not impossible, to say anything new, but a short biographical sketch is necessary in this first Memorial Lecture. He himself said in the dedication of the Wistar Institute of Anatomy in Philadelphia, "In the continual remembrance of a glorious past individuals and nations find their noblest inspirations", and, again, "Year by year the memory of men who made this institution fades from out the circle of the hills and the shadows of oblivion fall deeper and deeper over their forms until a portrait or perhaps a name alone remains to bind the dead with the quick". It is with the object of preserving his memory that this series of orations has been instituted, and, as in the case of the great Harvey and of John Hunter, I trust it will be successful in perpetuating the work and doings of William Osler.

He was born July 12, 1849, and was named William after the great William of Orange. He was the sixth son of the Rev. F. L. Osler, M.A. (Cantab), a Church of England clergyman, afterwards Archdeacon, who was priest, counsellor, and adviser of the Protestant Irish settlers north of Toronto, and his son's first guide and teacher. Osler's mother was also a notable person, a woman who, against the wishes and desires of her family, married the Rev. Mr. Osler and came out with him as the wife of a missionary to what were then the wilds of Canada. From her Sir William inherited much, and through her early care and counsel much of his character was formed. His father, feeling the need of giving his sons a better education, decided to exchange his mission at Bond Head for the comparatively more settled region of the Dundas Valley, where there was a good grammar school presided over by a graduate in classics of Trinity College, Dublin. In Dundas Sir William's boyhood was passed. "From this period we began to hear of the laughing, good-natured boy, quick at studies, good at games, straightforward and unafraid, with an affectionate interest in all his associates, an interest which never died." (Gwyn). And now came into his

life an influence which did much to shape his after career. He was placed under the Rev. W. A. Johnson at Weston, a teacher who inspired his receptive pupil and first gave him the love for natural history which early possessed him. At that time the microscope was little used and not well known in Canada, but his teacher was an accomplished microscopist, and the pupil took advantage of his opportunities. There was instilled into the young boy, as he says himself, the love of "the old humanities and the new sciences". For three years he was under the tuition of the Rev. W. A. Johnson. After he left school he had a year at Trinity University preparing for the Church, to which all his training was inclined to lead him. However, he soon changed his mind and left Trinity for the Toronto School of Medicine. Here he came under the influence of James Bovell, physician, naturalist, and afterwards priest. James Bovell must have had a wonderful attraction for him. The impress of this man's teaching was visible in Osler long after he had taken his degree. Many committees and other meetings we attended together when he was a professor at McGill. If one looked at the paper or blotter before Osler one found innumerable scribblings which were always the same, "James Bovell, James Bovell," repeated many times. Apparently this was done unconsciously. James Bovell increased in him the love of microscopic work first inspired by the Rev. W. A. Johnson. After a couple of years at the Toronto School of Medicine, he and a number of his friends came to McGill Medical School, chiefly because of the clinical advantages afforded by the Montreal General Hospital, and the opportunities for morbid anatomy.

The Toronto students joined McGill in 1870. I was then in my second year, having begun my studies in 1869. As I remember Osler in 1870, he was a thin, eager, energetic youth, with sharp, dark, piercing eyes, and a sallow complexion, restless, interested in everything and everybody, busy with his microscope, and always ready to give good advice and to help his neighbour. He was popular amongst the good students, but had no use for idlers and shirkers.

After his graduation in 1872 he went abroad, and I followed him a year after. I met him again in London before he left for home to

take the Chair of Physiology. He at that time communicated a paper to the Royal Society on the micro-organisms of the liquor sanguinis. In the autumn of 1875 I also went home to Montreal, as Demonstrator of Anatomy, and again was thrown into close contact with William Osler.

When abroad he had studied in London under Burdon Sanderson, and was a close friend of Edward (now Sir Edward) Sharpey-Shafer, who at that time was also at University College. In Berlin he studied under Virchow and in Vienna under Rokitansky. Of both these men he has written as he saw them at that time.

When in Montreal (1874-84) he worked hard at morbid anatomy, and gave a weekly demonstration on the various specimens collected to students and practitioners. He took a live interest in the Montreal Medico-Chirurgical Society, doing much work himself and stimulating others. He also made friends with his French-Canadian brother practitioners, and induced many of them to join the society. His influence everywhere was stimulating. Some of the older members of the Faculty looked upon him askance, as a too violent reformer. However, the younger members, such as Ross, Roddick, Buller, Gardner, MacDonnell, and others, strongly supported his reforms. He established the first physiological laboratory at the McGill Medical School, and made suggestions for reform in the teaching of other subjects. He, with Ross and myself, established a medical society which still functions.

In 1878 Ross and Osler went to England, where Osler took his M.R.C.P., and they followed Murchison in the wards.

In 1883 some deaths and many resignations took place. Professors MacCallum and Wright resigned. Dr. Scott, Professor of Anatomy, died. Professor George W. Campbell, who had been Dean for many years, had died in Edinburgh in 1882. He was a man of strong personality, and he was always on the lookout for promising young men. He strongly supported Osler. He was followed in the Deanship by Dr. Robert Palmer Howard, who was one of the three men whom Osler mentions as having strongly influenced him, and one of the three men to whom he dedicated his *Practice of Medicine*. Dr. Howard was an exceptional clinical teacher, and always followed his fatal

cases to the post-mortem room, and this encouraged and stimulated Osler.

In 1884 Osler went abroad and left his correspondence in my hands. A letter came from the Medical Faculty of the University of Pennsylvania asking him to be a candidate for the Chair of Clinical Medicine. I immediately forwarded it to Osler, advising him to accept. He at first thought that this was a joke Ross and myself were playing on him. However, he met others, such as Weir Mitchell, in London, who confirmed the offer. The call was not unanimous for Dr. Horatio Wood was unconvinced. So he paid a visit to Montreal, got in touch with the French doctors at the Nôtre Dame Hospital, and then came on to the Montreal General Hospital, where he went around with Dr. Richard MacDonnell, who did not know him, lunched with the internes, and heard all about Osler. Everybody, of course, was enthusiastic about him. I came to the hospital at my usual hour and met Dr. Wood at noon. I recognized him, and then taxed him with having come to spy out the land. He admitted the fact, and then asked me about Osler, and he heard the truth. He went home convinced that Osler was the man, and afterwards strongly supported him. That year, 1884, Osler was elected President of the Canadian Medical Association. He left McGill on six months' leave in the autumn of 1884, after a farewell luncheon, where a very affecting and appreciative speech was made by Dr. Howard, the Dean, to which Osler, owing to his deep emotion, had much difficulty in replying.

So Osler went to Philadelphia, and we were all desolate. But he came back frequently. He was given leave for six months, and if he was dissatisfied with Philadelphia and his work at the University, the door was left open for his return. At first he was a disappointment to the students there, who had been accustomed to eloquent clinical lectures from orators who spoke to crowded benches in the large amphitheatre, but often without patients to illustrate the lectures, and if a patient was occasionally obtained he was seen only from a distance. Now Osler was not an orator, and had rather a halting delivery, but he never gave a lecture without a series of patients to illustrate it, and he took classes of students through the wards and

brought them in immediate contact with the patient and disease, and after he had beds in the Blockley Hospital he followed up his fatal cases with a post-mortem in which the students immediately concerned in the case participated. After a time it was seen that this method of teaching was most informing, and soon his classes became the most popular in the University, for his joyous and familiar manners, his intense energy, earnestness, and friendliness appealed to the students, and his working out cases with them and his way of identifying himself with them was most taking. They all felt that they were helping in the diagnosis of the case. This was a most subtle way of interesting the student, and he now established a clinical laboratory in a small room at the end of one of the wards, for the examination of blood, sputum, etc., and every student was made to take part in these methods, up to that time unknown in the hospital for purposes of diagnosis. He all the time was giving lectures before societies and writing papers. He was elected a member of the College of Physicians and Surgeons and took a great and active interest in their fine library, of which he was made a member of the Committee. In fact, the medical community felt that a new force had come among them, stirring them up to better work. He attended the medical society with great regularity, and brought the Jefferson school and the University men into closer touch. He made many friends, among whom his especial friends were the Grosses and the Hays, and wherever there were children he made special friends of them.

Dr. Ross and myself made frequent visits to Philadelphia, and saw how much he had worked his way into the hearts of the profession and how much he was thought of. In 1889 came the first meeting of the triennial association of the various societies, to which many foreigners, and English and Canadian doctors were invited,—Esmarek from Germany, Ferrier and the Horsleys and Sir William McCormick from England, and many of the men from Toronto and Montreal. On the way home some of us stopped off at Philadelphia, where a great welcome awaited us, and many entertainments. My wife, who had remained with friends in New York, was brought to Philadelphia by Osler without my knowledge, and she met me there, much to my surprise, and she participated with me in many

of the lunches and dinners offered to the visitors (a touch of the thoughtfulness of Osler). They were most pleasant, and we had the opportunity of meeting many celebrated physicians and surgeons from abroad. Dr. Horatio Wood, now a great advocate of Osler, was among the most active of the entertainers, and Dr. and Mrs. Samuel Gross and the Hays.

About this time the Medical School of Johns Hopkins was being organized by Dr. Billings, and there was then some talk of Osler's being called there to organize the Medical Department of the Faculty. Of course, the Philadelphians were much opposed to losing so celebrated a teacher, but he accepted the call, feeling that he would have a free hand to introduce teaching methods which appealed to him as necessary to the advancement of any school which wished to be in the forefront of medical teaching.

I remember once crossing the Atlantic with Dr. Billings, and he told me that the greatest thing he had done, and on which he most congratulated himself, was the appointment of Drs. Welch and Osler to Johns Hopkins.

Perhaps Osler's reputation in the future will depend on his teaching of modern clinical medicine, combined with his knowledge of morbid anatomy. At a time when the microscope was little known by the medical profession, he was using it to elucidate the various problems that presented themselves; also his connection with the Veterinary College affiliated to McGill enabled him to make use of much material that would otherwise have been lost. He had a marvellous capacity for exact observation and thoroughness of investigation. He gained complete knowledge of his subject and was never superficial. He it was who introduced, through Johns Hopkins and the University of Pennsylvania, bedside-teaching into the University medical schools of the United States. Whilst at Johns Hopkins he wrote the best text-book on the "Practice of Medicine" ever written, compact, lucid and free from verbosity, from his own clinical experience, chiefly obtained during his stay in Montreal. It went through many editions and supplanted all other textbooks of medicine.

In his teaching he inspired all his students, and taught them by his human sympathy to treat their patients as human beings and not as cases. At Johns Hopkins his influence was paramount.

He regarded all his students as friends, and kept open house for them and their friends, who were constantly visiting the hospital.

In 1889 Osler sustained the serious loss of two old friends, Dr. R. Palmer Howard, and Dr. Sampson of Philadelphia; both died of pneumonia.

At a dinner of six hundred medical men given at the Waldorf Hotel, New York, in May, 1905, before he left for Oxford, Professor J. C. Wilson said of his Philadelphia period, "Not only by precept but by example has he been an uplifting influence on our professional life. . . . the source of that influence is to be sought not merely in his accomplishments as a physician, not in learning, not in wisdom, not even in his buoyant well-balanced temperament, but in that basic principle which we all recognize but never can define; which, for want of a descriptive name, we call 'character'." Dr. W. H. Welch, at the same dinner, said, "His most striking contribution to the life of Johns Hopkins has been the interest which he has aroused amongst students and the personal influence which has enabled him to bring out in them the best of their moral and intellectual points." This feature, as Dr. A. Jacobi has justly said, "has been a labour of love and no hardship."

Whilst at McGill he instituted many reforms and innovations, and, supported by a number of eager and enthusiastic young men, brought the dead bones of the Faculty to life again. He was a continual inspiration to his colleagues and the students. He made morbid anatomy, aided and supported always by the Dean, Dr. R. Palmer Howard, a subject eagerly followed by the students. Whilst a physician to the Montreal General Hospital he edited the first volume of his celebrated Pathological Reports. Dr. Maude Abbott says that the specimens described are still in the museum, having escaped the fire of 1907, also that the wonderful specimens of endocarditis on which his Goulstonian Lectures were founded are still in good preservation.

Osler was fond of practical jokes, which he was continually playing on his medical friends and associates, but they were always harmless and intensely amusing, for he had a wonderful sense of humour and was never downhearted, for, being an optimist, he saw the brightest side of everything. By nature and upbringing

he was intensely religious and was well read in the Bible. When a student he was an ardent attendant at St. John's Church, a very "high" one, and under the care of the Rev. Edmund Wood. He was often seen at early service before breakfast. The church was at the corner of the street he lodged in, St. Urbain and Dorchester. He was intended for the Church and had, as I have said, attended the divinity lectures of Trinity College, Toronto.

Osler always took a great interest in epidemic diseases. When in Montreal he was appointed physician to the smallpox hospital, which at that time was an appendage to the Montreal General Hospital, and, to become better acquainted with the disease, caught it himself, very mildly, fortunately, for he was well vaccinated.

His text-book and various articles show that he was well acquainted with the work of the early epidemiologists. Although smallpox, cerebro-spinal fever and syphilis interested him greatly, and were the subjects of addresses, yet he was more interested in typhoid fever, which was rampant in Baltimore when he was there. Typhoid fever, he said, was a sanitary index of the community, and the United States was a generation behind Europe. When the late war commenced, he was strong on the anti-typhoid inoculation of the soldiers.

Osler's interest in tuberculosis was always great. He instituted many societies for the study and prevention of this disease. In 1902 he started the first tuberculosis dispensary in Baltimore, and he took an active part in connection with the anti-tuberculosis campaigns throughout the States. In England he helped to form the National Association for the Prevention of Consumption. In 1910 he started an Oxford branch of this Association.

Whilst in Montreal he became convinced of the contagiousness of tuberculosis, and also, with the late Principal McEachern, of the transmissibility of bovine tuberculosis to man, and at the same time of their difference. He was one of the first to recognize the contagiousness of bovine tuberculosis through infected teats and flesh insufficiently cooked. He was greatly interested in the work of Trudeau, of Saranac, and frequently visited his sanitarium, in every way co-operated with him, and on

To have come into contact, even momentary, with Osler's vivid personality is a privilege; it is a greater privilege to have come under the influence of his teaching and example; it is an inestimable privilege to have been in close association with him for two and a half years in the work of a great modern hospital.

I have never known anyone who was surrounded by such a distinctive, attracting, personal "aura." It was something that was felt as well as seen. It commanded respect, admiration, and, to an even greater degree, affection. If to anyone, the much abused word "magnetism" was applicable to him in its best and truest sense. Imitation is said to be the sincerest form of flattery, and it is quite true that most of the young men who worked under him became imbued with something—if only an infinitesimal part—of his spirit and even of his manner, as well as with his methods of teaching and investigation.

Great learning he had — deep wisdom, shrewdness in the best sense of the term—but

his large charity, so different from mere *bonhomie*, which is common enough in small souls, was the quality that endeared him to all. He was intensely human and loved humanity. 'Homo sum, et nil humanum mihi alienum puto' might well have been his motto.

That he is, and is likely to remain, the outstanding figure of Canadian medicine none can dispute. That he was equally during his lifetime the outstanding figure of the English-speaking medical world, and possibly of world medicine, is maintained by many. The perspective of time will determine this, as it has done with other examples of high human endeavour and accomplishment."

Much interest was also added to the occasion by the presence of Dr. W. W. Francis, Osler's cousin, the Librarian of the Osler Library, who gave a graphic account of Osler's development as a bibliophile, and the establishment of the *Bibliotheca Osleriana*. His remarks follow in full.

THE OSLER LIBRARY

By W. W. FRANCIS, M.D., LIBRARIAN,

Montreal

THE Library which Sir William Osler bequeathed to McGill University, and of which I have the good fortune to be librarian, contains some 7,600 volumes, for the most part choice books, old and new, selected by a great master of the subject with a view to their value in the study of the history of medicine and science. It includes the greater part, but by no means all, of the books which filled his house at Oxford. A collection of works on the heart and lungs he left to the Johns Hopkins Hospital, and another, containing important editions in English literature, went to form the nucleus of the library of the Tudor and Stuart Club, founded and endowed by him and Lady Osler at Johns Hopkins University in memory of their son.

His recently published catalogue contains an unfinished Introduction, entitled "The Collecting of a Library". It is a sort of bibliophilic autobiography, and from it most of what I have to say to you is abstracted.

Osler was fortunate in his teachers, W. A. Johnson of Trinity College School, James Bovell of Toronto, and Palmer Howard of McGill. They instilled into him not only the love of science but also the love of books. He recalls

with particular gratitude Bovell's excellent library in which he browsed freely during his two college years in Toronto. The best, he says, that the human mind had afforded was on Bovell's shelves, and in him all that one could desire as a teacher.

The first book he bought was the *Globe Shakespeare*, and he often invoked "the curses of Bishop Ernulphus on the son of Belial" who stole it. His second purchase was an 1862 Boston edition of Sir Thomas Browne's "*Religio Medici*." This was in 1867, when he was eighteen, and book and author became his lifelong favourites. That particular copy, the father of the collection which McGill has inherited, went with him everywhere, and on his deathbed he scribbled in it in pencil this proud boast, "I doubt if any man can more truly say of this book, *Comes viae vitaeque* (companion on my life's journey).

During his fourteen busy years in Montreal there were cobwebs in his pockets, but he spent more time and money than he could afford in a nearly successful attempt to collect all Canadian medical and scientific journals. These he gave to the Medical Library when he left Montreal

in 1884. In Philadelphia he began to collect American medical classics—and to read them, for he was never merely a collector. In Baltimore, in the 'nineties, with a purse which might have bulged if he had ever tried to close it, he bought freely. Many of the old books were acquired at this period, especially editions of Vesalius and of Linaere, Harvey, Browne, and other English worthies.

Current books and journals were constantly passed on to friends and libraries to make room on his shelves. Book-sellers' catalogues appeared on the breakfast table and were always with him on railway journeys. In the summer holidays, usually spent in England, the old book-shops were his happy hunting ground. But it was not until after 1905 when he went to live in Oxford, a book-lover's paradise, that the present collection really took shape.

Let me quote his own words: "As the collection grew, plans for its disposition had to be considered. Already at the outbreak of the War my son, Edward Revere, aged 18. . . . had shown unmistakably the direction of his tastes, and it was agreed that he should take the works in general literature while the scientific books should go to McGill. . . . Though a wanderer, living away from Montreal for more than half my life, the early associations I have never forgotten. The formative years were there with the strong ties of head and heart. As a young, untried man, McGill offered me an opportunity to work and to teach, but what is more, the members of the Medical Faculty adopted me, bore with vagaries and aggressiveness"—aggressiveness is a word that could be applied to him only by Osler himself—"and often gave practical expressions of sympathy with schemes that were costly and of doubtful utility. That they believed in me helped to a

belief in myself, an important asset for a young man, but better had by nurture than by nature. Alma Mater, too, counts for much, and as a graduate of McGill I am proud of her record. Had I not seen the day of small things? Did I not graduate in the days of the Coté-Street school? I may quote Fuller's sentiment: 'He [Fuller's Good Bishop] conceived himself to

hear his Mother Colledge alwayes speaking to him in the language of Joseph to Pharoah's butler, But think on me, I pray thee, when it shall be well with thee.' Then there is the natural feeling of loyalty to the country of one's birth and breeding. These are the considerations which decide me to leave the special collection to my old school at Montreal."

"As the books increased," he continues, "the hope matured into a scheme for a library which would have a definite educational value and a literary and an historical interest. To break a



collection into sections is hazardous, but I considered that, after all, this would form a special part of the Medical Faculty Library just as the latter is a section of the University Library." He decided, therefore, to follow his own plan and group the books in eight sections. The first section, which is the chief and original feature of his library and catalogue, he called *Bibliotheca Prima*. It was planned to contain, in chronological order, and in a comparatively small number of works,—there are about 1,700 items in this section—the essential literature of the evolution of science, represented by the works and lives of sixty-seven authors who, in his opinion, were contributors of the first rank to science, beginning with Hippocrates and ending with the nineteenth century. He tried particularly to obtain the fundamental contribution in each subject, whether this was represented by a

great Aldine edition like that of Aristotle, or a three-page pamphlet of Röntgen.

The second and largest section, more strictly medical, contains the works of authors not classed among the outstanding pioneers. The third, called Litteraria, deals with the relations of medicine and general literature. The next three sections are History, Biography, and Bibliography, almost entirely modern books; the seventh and eighth are Incunabula and Manuscripts. Of the books printed in the fifteenth century, technically known as incunabula, he succeeded in acquiring 136, some of them with funds contributed for the purpose by his brother, the late Sir Edmund Osler. With the 30 or more incunabula already in the University Library, McGill is now rich in these artistic and historically interesting treasures.

"The Library," Osler wrote, "is for the use of students of the history of science and medicine, without any other qualifications, and I particularly wish that it may be used by my French-Canadian colleagues, who will find it rich in the best of French literature."

Before the War Osler had begun to give effect to what he called his "ambitious desire to prepare for printing a *catalogue raisonné*, with biographical and bibliographical notes." In 1919 he remarked that he needed ten years of not too senile leisure in order to complete both collection and catalogue to his satisfaction. *Dis aliter visum*. Before his death, at the end of that year, he requested that the catalogue should, if possible, be finished and printed before the books went to Montreal, and he named four editors, his bibliophile friend Mr. L. L. Mackall, of Savannah, Dr. Archibald Malloch, of McGill, now Librarian of the New York Academy of Medicine, Mr. R. H. Hill, of the Bodleian Library, and myself. That we have been privileged to carry out this labour of love we owe to the authorities of McGill, who were content to wait patiently for the books, and to Lady Osler, who whole-heartedly devoted the rest of her life to the task which, to our lasting sorrow, she was destined not to see quite completed. She died in August, 1928. Besides having financed the catalogue, she generously bequeathed £10,000 for the upkeep of the Library.

It is the intention, and it was Osler's wish, that the collection be added to and gaps filled, as funds and opportunity may permit.

The catalogue, entitled "*Bibliotheca Osleriana*", was published in May by the Oxford Press. It is a book of over 800 pages in large format, and has already been welcomed by those who know as a contribution of real value. It is fundamentally Osler's own work. The interesting arrangement of the books is wholly and the annotations largely his. It will always be useful to many who have not access to the library itself, and it may well continue to be quoted long after its author's other works are forgotten. As he himself once wrote, "There is no better float through posterity than to be the author of a good bibliography."

The Library was officially opened on May 29th, and those of you who have seen the beautiful room must agree that the University, the architect, Professor Nobbs, and the Bromsgrove Guild, have provided the books with a new home worthy of the gift. The books have been arranged on the shelves in the catalogue order, except his own writings and those of his favourite authors, Sir Thomas Browne, Burton, Rabelais, and others. These occupy the place of honour at the end of the room, in an alcove in the centre of which is a panel bearing his portrait in bronze; and behind that his ashes, as he desired, repose among his beloved books.

Thus is fulfilled in essence, if not in all its details, a hope he first expressed some twenty years ago in an unpublished paper entitled "*The Burrowings of a Bookworm*". It is written in his own hand, not by "William Osler", but by his other self, the equally loved if somewhat less reputable "E. Y. Davis". After discussing the fate of some great private collections he wrote this passage, which I may quote in conclusion: "I like to think of my few books in an alcove of a fire-proof library in some institution that I love; at the end of the alcove an open fire-place and a few easy chairs, and on the mantelpiece an urn with my ashes and my bust or portrait, through which my astral self could peek at the books I have loved, and enjoy the delight with which kindred souls still in the flesh would handle them."

The Inaugural Address

AT THE

SIXTIETH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION*

BY A. T. BAZIN, M.D.

President, Canadian Medical Association,

Montreal.

I DO not propose to inflict upon you any prolonged dissertation relating to the history of this Association or of medical progress in general. Having had now some few years' experience associated with the editing of our *Journal* I realize with what dismay many presidential addresses are received and with what trepidation the Editor uses the scissors and scoring pencil to reduce them to a readable size. But I do wish to express my deep gratification and appreciation of being thus honoured by my colleagues, an honour which I consider to be the highest in the gift of the medical profession of Canada. I pray that I may be granted the wisdom and strength to do what should be done for this Association by its President.

It has been borne in upon me during the past few months, and particularly during the last hectic weeks, when illness deprived our organization of workers holding key positions, that the duties required of the President-elect in organizing the Annual Meeting are not conducive to that state of mental quiet necessary to bring forth an address that would be worth-while. And I offer the suggestion that the President's annual address should be valedictory rather than inaugural. The year's experience in the office should make a powerful impression upon any man worthy of the post and he should surely have a real message to convey. So you will excuse me if I confine my remarks to a few disjointed subjects.

First, I wish to express my grateful appreciation to all those who have worked long and hard to make this meeting what it is on paper, and what we all hope it will prove to be in reality. Comparisons are odious, but I feel that I will hurt the feelings of none if I mention particularly in this connection Dr. Léon Gérin-Lajoie, Secretary of the Province of Quebec Medical Association,

whose unfailing zeal and energy have been invaluable. To the Government of the Province of Quebec, through the Honourable Athanase David, to the City of Montreal, and to others who desire to remain incognito, we owe generous support. To the Kiwanis Club and the Rotarians of Montreal we are indebted for the courtesy of abandoning the rooms of this Hotel in our favour. To our hosts and hostesses, and to many others whose names are almost legion we gratefully acknowledge kindness and hospitality. And to the contributors to our scientific program, especially to those who have travelled from afar, we are beholden in such manner as cannot be repaid.

This convention bids fair to be unique. In few places, if, indeed in any other city, can there be demonstrated side by side the methods and practice of two distinct schools of medicine, both pushing on toward the same goal, but by somewhat differing routes. The French school is faithfully mirrored in the Université de Montréal and the hospitals attached thereto. A large proportion of its teachers of Canadian origin are trained in France, whilst by a loan system the professors of the Faculties of Paris, Lyons, Strasbourg become for a period of years the actual teachers in this city. I wish to urge upon the members of Council, and through them upon the membership of the Association as a whole, the great desire of our French colleagues to demonstrate their work. Every teacher, almost without exception, is prepared to present or discuss his subject in your language as well as in his own.

In a mental survey in preparation of this address one topic especially obtrudes itself. You have in the agenda before you the resignation of our Editor, Dr. A. D. Blackader. We grieve that he is absent from among us, but we rejoice that he has weathered the storm of a recent severe illness. We are also privileged to be able to

* Delivered before Council of the Canadian Medical Association, June 17, 1929.

convey to him our congratulations and felicitations upon the occasion of his eighty-second birthday on the 19th of June, two days hence. At an age when most men have laid, or are laying by one burden after another, Dr. Blackader, ten years ago, took upon himself, as a labour of love, what proved to be probably the heaviest and most exacting burden of his whole career. No one not intimately associated with him can realize what self sacrifice has been entailed, not only upon himself but upon Mrs. Blackader. We shall sorely miss his guiding hand, but trust that he will enjoy for many years to come the leisure for recreation and contemplation which the selfish needs of the Association have denied to him during the past decade.

THE ASSOCIATION

The Canadian Medical Association stands for unity in the profession of Canada. In different Provinces and sections we may approach that unity of purpose and ideals from different angles and along different roads, but our eyes are set upon the one goal. And therein lies our strength. In course of time it may be that the Association will embrace in its membership all the medical practitioners of Canada, but that time is not yet. Coercive measures will not achieve our purpose, nor will legislation enforcing membership be fruitful of good results. For the strength of the organization lies not in its numbers but in its activity. Better a "flivver" with "pep" than a steam roller with no steam. The latter sinks more and more deeply into its own ruts.

Our General Secretary informs me that this is the largest meeting of Council in the history of the Association. Nearly one hundred of you have hurried to this assembly. Not for pleasure are you voluntarily attending these business meetings, forenoons, afternoons, and possibly evenings. You have faith in the future of your Association, you have pride in past achievements. By your example, and that of your active committees throughout the year, will the religion of organized medicine gain converts from among those who have not yet seen the light.

THE POST-GRADUATE WORK

At no gathering of Canadian Medical Association members can this greatest of all achievements be passed by in silence. As this is the first meeting in Montreal since the inception of the work, we had hoped to have as our honoured guests to-day Mr. Macaulay and Mr. Wood,

that Council might have the opportunity to express to them in person the indebtedness of the whole profession of Canada and indirectly that of the community. But unfortunately for us that is not possible. Mr. Macaulay is across the seas on another errand of beneficence, and Mr. Wood sails in a few hours. The Post-graduate work is now in its fourth year and has gained such momentum that it cannot cease.

And whilst remembering the benefactors who made this possible we must also express our gratitude to those committees who unceasingly direct the work and to those who contribute so unselfishly in time and energy to disseminate their knowledge.

HOSPITAL SERVICE

In the short period of the life of this Department much more has been accomplished than appears on the surface. The Association is fortunate in the choice of Dr. Agnew as Associate Secretary in charge of this branch. He has approached the problems with no preconceived ideas, and is rapidly making headway in the rapprochement of divided interests.

There are three primary component parts of a hospital, the medical attendance, the nursing service, the financial and administrative problems. My own conviction, after many years' association with hospitals, is that the medical profession is the one party which requires, more than the other two, elucidation of the problems of hospital administration. I would like to see a Hospital Section of this Association holding its meetings regularly and discussing with representatives of the other two parties the problems that are constantly arising. If luxury in plant and equipment, if waste of supplies, were eliminated we would be well along the road toward reduction of expense to the patient. I look forward with eagerness to the presentation at Friday's session of Dr. Murphy's paper "The Duty of the Doctor to the Hospital"

HEALTH EDUCATION AND SERVICE

For more than a year our Association has been engaged in this work. For the results accomplished we are indebted to Dr. Grant Fleming who has voluntarily devoted much time to the preparation of these articles for the press. It is gratifying that the value of this service has been recognized and by means of a grant from the Life Insurance Officers' Association of Canada the work can be placed upon a firm basis and can be extended

in ways to make it even more productive of benefit to the community.

PERIODIC HEALTH EXAMINATION

As an Association and as individuals we are intensely interested in the health of the community. We are all of us, without question, anxious to prolong the *useful* life of every citizen. We believe that periodic health examination is a means to that end. Hence for some years we had a committee to evolve a system whereby the profession would be prepared to undertake the work when the demand arose. The manual and the forms were the result of this Committee's deliberations. That some have erroneous conceptions of the scheme is evident from correspondence and discussion. Hence the preparation of a moving picture film which will be presented by Dr. Martin at Thursday's session. Our primary duty is to educate *ourselves* to properly examine, assess, and advise these health candidates. The demand for this service must be spontaneous on the part of the client, or suggested by some other organization. That such a demand is imminent will be disclosed during this session of Council.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

That this ancient and honourable body should have seen fit to entrust to our Association the organization of the Primary Examination in this country is a source of pride and gratification to us. That the privilege is appreciated by our young men is evident from the large number (30) of candidates who will present themselves next August. We are grateful to Dr. Primrose, who, as Chairman of the Committee, brought the negotiations to a successful issue. And Council should also be apprised of the fact that Dr. Primrose is cutting short his holiday in order to attend during the progress of the examinations.

ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

For many years this problem has been the football of committees of this Association. Three years ago Dr. David Low took charge and at the meeting in Toronto in 1927 presented his arresting report. Thenceforth progress, though slow, has been steady, and Dr. Fred Starr is now able to report that the bill has become law. The elaboration of details is still necessary. The advantages accruing from this step will depend altogether upon the standard set at the beginning

and maintained thereafter. Here again there is no strength in numbers alone. The benefits sought apply not to us but particularly to those who follow us.

BRITISH MEDICAL ASSOCIATION AFFILIATION

Our bonds with the older Association become stronger, though no tighter. They are the bonds of sympathetic co-operation, not the shackles of control. We are privileged to welcome to this meeting two official delegates from the British Medical Association, and to their Manchester meeting next month we delegate a number of our own members.

But any reference at this time to the British Medical Association is completely overshadowed by the imminence of the meeting in Winnipeg. I do not propose in the slightest degree to "steal the thunder" of our Winnipeg friends, but we wish to assure them that this Association has every confidence in their ability and determination to provide a meeting next summer which will go down in the annals of both Associations.

THE NURSES

Two weeks hence Canada—and Montreal—are to be honoured by entertaining the International Congress of Nurses. Members of this Association have received a cordial invitation to attend any and all the sessions. The anticipated registration approximates seven thousand. I mention this to demonstrate that nurses the world over are in anxiety and unrest concerning their problems, particularly those of training and education. We have had, and still have our own problems as regards medical education. But our task is rather easier than theirs, as they must consider so many interests other than their very own. Inasmuch as the work of the nurses is so closely linked with our own, I am convinced that we can be a factor in assisting them in their studies. To this end our Association has had a Committee at work for two years, and I can assure you that the interest thus manifested is welcomed most heartily by the Canadian Nurses Association.

GOVERNMENT RECOGNITION

At various times and in different ways this Association has been approached by the Federal Government. This spasmodic recognition has now culminated in the very desirable appointment to this Council of a medical representative

of the Minister of National Health. To this end you will be asked to amend the Constitution in such manner as recommended by the Committee in charge.

You will note that I have touched upon only those activities of the Association which are concerned directly or indirectly with improving or enhancing the value of the profession to the community. In my opinion these are the only ones really worth while, the only ones which will result in real progress and real growth of the Association. I have attempted as it were to hold a mirror before you—to see ourselves as others see us—to impress upon you these facts:

1. We are honoured by having as Patron, His Royal Highness, the Prince of Wales.

2. We are recognized by the Government of Canada as co-workers with the Minister of Health.

3. We are entrusted by responsible corporations with the administration of large sums of money in the interests of the health of Canada.

Does not all this indicate that we have reached adult stature and have assumed the responsibilities of grown men?

And I close these rambling remarks with a challenge and a pledge—Gentlemen—To Work and to Service!

THE ADDRESS

ON

THE SUDDEN ONSET OF LUNG TUBERCULOSIS IN THE ADULT AND ITS LOBAR LOCALIZATION*

By E. RIST, M.D.,

Paris, France

WE have all been taught that the onset of pulmonary tuberculosis in its usual form is generally an insidious and slow one. This was in accordance with the commonly held opinion that, anatomically, consumption begins with one or a few microscopical tubercles located in the apex of a lung, and that from this initial and very small lesion the disease gradually extends centrifugally, new tubercles being formed in the neighbourhood of the primitive ones, the bacilli being carried away from the primary focus through the lymph-channels. This theory was based mostly upon the very painstaking and accurate study which had been made of the manner in which experimental tuberculosis develops from the site of inoculation in the guinea-pig. It received also some support from post-mortem examinations, made on persons who had died of a disease other than consumption and who were found to be the bearers of an occult, latent and very limited form of tuberculosis. And there was, furthermore, I may add, much in it which seemed in accordance with the old,

traditional opinion which considered consumption as a constitutional, mostly hereditary, disease, an opinion which of course Villemin's inoculation experiments and Robert Koch's discovery of the bacillus had made quite impossible to hold, but which, even in our days, has not yet quite ceased to influence, more or less unconsciously, the medical mind.

Viewed from the clinical point of view, this theory implied that the transition from a condition of unimpaired good health to disease went on almost insensibly, tuberculosis in its early stages being a slowly creeping disease, producing symptoms and signs only when it had, from initially minute lesions, extended and progressed to a sufficient degree. Therefore, all the skill and keenness of the clinician were directed towards the detection of the earliest possible signs, a still minute lesion might give. I shall not attempt to describe nor to criticize all the niceties of percussion and auscultation which were supposed to enable us to ascertain the presence in a lung apex of a small cluster of fresh, newly formed tubercles developing after contagion had taken place, in people who had no definite symptoms or no symptoms at all. These transcendental steth-

* Delivered at the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, on June 21, 1929.

acoustics, to which the names of Grancher, of Turban, and Gehrhardt are attached, and to which most of us adhered so reverently in their youth, have proved on the whole very disappointing.

When the x-rays were discovered in 1894, it was thought by many that they would be more powerful than our ears to detect those minute initial lesions of incipient tuberculosis. But the x-rays either failed to show us any alterations in the lung—and it was a triumph for the clinicians who prided themselves in making them out by percussion and auscultation—or they showed extended, often excavated, lesions involving a third or a half of a lung, in cases which the clinicians regarded as incipient or only suspicious, and it was the turn of the radiologist to feel elated. Of course there were also peacemakers who endeavoured to find a conciliatory ground, and one began to attribute confidently all sorts of ominous meanings to harmless hilus and peribronchial shadows. These were the palmy days of so-called peribronchial tuberculosis, creeping silently from the hilus to the apex, a very agreeable theory indeed, but which unfortunately no post-mortem was ever able to confirm.

During that period, which, I am afraid, is not quite over, the x-rays proved a diagnostic failure, not because they really failed to show us things as they are, but because we insisted upon them showing us things as we wanted them to be, and this they could not do. As soon as this objectionable, but after all not unnatural, position was abandoned, and we candidly expected the x-rays to show us things we did not know, they rewarded us with a great deal of new and valuable information.

Pirquet's momentous discovery of the skin tuberculin test, in 1908, gave a quite unforeseen turn to our diagnostic cogitations. At first it was believed that it would simplify to a considerable degree the detection of incipient tuberculosis. You know that it did nothing of that kind, at least as regards incipient tuberculosis in the adult. Its properly diagnostic applications are limited to infancy and early childhood. In the case of the grown-up men and women it cannot help us diagnostically, because it is positive in the greater majority of them. But it has taught us something which is of much greater value than a mere diagnostic

procedure, namely, to discriminate sharply between tuberculous *infection* which, acquired in childhood and adolescence, is almost universal among the adults living in civilized urban communities, and tuberculous *disease*, which affects only a small minority out of them and as a rule is not co-incident with primary infection.

The diagnostic problem in the adult does not therefore rest upon making out the earliest possible lesion following the first introduction of tubercle bacilli into the respiratory tract. This is an affair long foregone and concerns the pædiatrist. Our problem is now quite different and may be expressed in the following words:

An adult having a positive skin test, and, accordingly, bearing an old primary inactive focus of tuberculosis, which during a long period of time has kept him resistant to tuberculous disease, becomes under certain circumstances deprived of such resistance. A change has occurred in his allergic condition. Be it that it has suppressed the check put on the multiplication of the bacilli acquired by him on the occasion of his first infection, or be it that a new infection from outside has overtaken him in a state of anergy, a question in which I shall not enter to-day, the fact is that he begins to react to infection by disease. An active lesion takes place in the lung, and is manifested by general and functional symptoms. From a healthy he is turned into a sick man. Now, how does this change from health to disease show itself, by what symptoms and what signs? How shall we be able to recognize it?

The classical and traditional opinion according to which tuberculosis begins insidiously in the adult and, during its early stages, progresses very slowly, has no doubt some truth in it. But it is a limited amount of truth, which applies only to a limited proportion of real facts. We all have met the type of patient our text-books so complacently describe; a man who, at first, experiences nothing more than feeling more tired than usual after his daily work, eating his meals with less appetite, losing weight slowly, and who finally becomes concerned with a little coughing which began he does not know exactly when or how; he may have a slight flushing of the cheeks in the evening and some night sweats. After having paid no attention to it for weeks or months,

and perhaps prompted by an occasional blood-spitting, he consults a physician who finds the physical and x-ray signs of a very limited infiltration in an apex.

But we will more frequently, if we know how to look for him, meet an early consumptive of a very different type. I think I can best convey to you what I mean, by giving you one or two histories:

CASE 1

R. F., a medical student, aged 21, came to consult me on June 3, 1921, under the following circumstances. In perfect health, working hard at the medical school, and at the same time very fond of sport and physical exercise, rowing and foot-ball especially. He entered military service, which as you know is universal and compulsory in France, on October 2, 1920. He was first assigned to a cavalry regiment in Paris, and after some time transferred to an infantry regiment, also in Paris. Facilities were given him for keeping up his medical studies to the extent of their being compatible with his military duties. He took the best advantage he could of these facilities and passed successfully several examinations at the medical school, doing at the same time hospital work as a clerk. I insist upon these details, in order to show that he lead a very strenuous life and stood it very well, keeping in good form and complaining of no fatigue whatever. During that whole period he was submitted to six routine medical examinations, on his enlisting into the army, on his entering the cavalry regiment, on his entering the infantry regiment, again previous to typhoid inoculation, and on two other occasions. These six examinations, some of which at least, we must admit, were conducted very thoroughly, found him in perfect health. He himself asserts quite positively that he had had no symptoms of any kind and felt altogether fit. Since entering the army his body-weight had dropped from 71 to 69 kilos, a loss of 2 kilos, which, given the very active life he had to lead, can certainly not be regarded as abnormal.

On May 25, 1921, he went with his regiment for a military march of 25 kilometers. On the next day he played a game of football, during which he suddenly felt bad, fell to the ground and swooned. On the 27th he felt exceedingly tired and was kept in bed at the regimental infirmary. The medical officer noticed that he was expectorating a little, examined his sputum and found that it contained tubercle bacilli. His temperature was over 40°C. As his father, who is a chemist, lived in Paris, he was immediately sent home, where he went to bed. The temperature gradually went down; on June 2nd it was 38.2°C. He felt much better. His father brought him to my office the next day, June 3rd.

I found dullness and a suppressed vesicular murmur in the upper third of the right lung with some crackling râles. Looking at his chest with the fluoroscope, I saw a condensation of the whole upper right lobe, sharply limited inferiorly by the interlobar fissure, underneath which there was no abnormality to be detected. A film was taken the next day; it confirmed that the condensation was a lobar one, and gave us the additional information, that in the centre of it, underneath the clavicle, a cavity, about the size of a walnut, had formed. The left lung was sound. On June 6th, I performed an artificial pneumothorax, which gave an excellent result and ultimately led to complete recovery.

Here, therefore, we have a young man whom we have every good reason to consider as having remained in perfect health until May

26th. On that same day, he suddenly falls ill, and, after less than a week, he is found the bearer of a tuberculous lesion extending to a whole lobe, with a cavity, and with bacilli in his sputum. When he came to see me, on the 7th day of his illness, the acute symptoms, fever, malaise, had disappeared; he felt much better and his sputum had begun to diminish.

Of course, it may be objected that his good health previous to May 26th was only a delusion. It will, perhaps, seem to many almost incredible that lesions may have extended to a whole lobe and undergone cavitation in such a short time. And yet the arguments in favour of his lungs having been sound until the first day of his feeling unwell are very strong. But let us admit the objection, provisionally at least. How then shall we account for the following story?

CASE 2

S. G., a girl of 20, was employed as an orderly nurse at the Seaside Hospital for bone and joint tuberculosis at Berck-sur Mer. She was well and complained of nothing. On May the 30, 1925, she underwent a routine medical examination prescribed as a preventive measure for all the personnel of the hospital. The physician in charge, an able and experienced man, whom I know personally, found her lungs all right on the fluoroscope as well as by physical examination, and pronounced her in good shape. A fortnight later, waking up in the morning, she was suddenly seized with a sharp pain in the left side of her chest, under the clavicle, which caused her to breathe with difficulty. She had several chills, and the same evening her temperature was 40°C. She began to cough and expectorate. She remained in bed, feeling very bad and exhausted. The temperature kept high during several days; she had night sweats, and lost weight rapidly. Her sputum, which was thick and yellow, contained tubercle bacilli. On the 8th day she was examined under the fluoroscope, which showed a dense shadow covering the whole of the upper lobe. She was without delay transferred to my department at the Laennec Hospital in Paris, where a skiagram was taken less than one month after the first day of her illness. It showed a large cavity under the clavicle, in the midst of a dark condensed upper left lobe. The physical signs were in accordance with the information given by the x-rays. The right lung was sound. An artificial pneumothorax was successfully performed.

Here we have, thanks to the competent fluoroscopic examination made a fortnight before the onset, positive proof that the lung was sound, perfectly transparent, when these extended and excavated lesions developed with such dramatic suddenness. It requires undoubtedly rather fortunate circumstances to bring it about that a complete physical and radiological examination should be made of an individual one or two weeks before he suddenly falls ill with consumption. Thanks to the

full capacity for work, I was surprised to see how often I came across histories of a sudden acute onset. I asked successively two members of my staff to make a survey of that kind. Dr. Dudan¹² in 1925 took the complete history of 100 consumptives (50 male and 50 female) in the chronological order of their admission into my department. Dr. Blanche¹³ in 1927 made a similar inquiry on 200 consumptives (100 male and 100 female). Their results fell very much in accordance. Here are Dr. Dudan's figures:

	Per Cent
Insidious onsets	34
Hæmoptoic onsets	6
Sudden onsets preceded by light prodromal symptoms	12
Sudden onsets without prodromal symptoms	48

And here are Dr. Blanche's figures:

Progressive onsets	37
Hæmoptoic onsets	13
Sudden onsets	50

Under the term "progressive onsets," Dr. Blanche distinguishes on one hand genuine insidious onsets which represent 44.5 per cent of the progressive class and 16.5 per cent only of the total, and on the other hand rapidly and regularly progressive onsets which are a kind of intermediate class between the truly insidious and the sudden, and probably can be put alongside with the cases which Dr. Dudan calls sudden onsets with slight prodromal symptoms. It must further be remarked that a certain proportion of hæmoptoic onsets really belong to the sudden type, that is to say, when hæmoptysis coincides with the ordinary febrile and acute symptoms of the sudden onset. Anyhow, in each of those statistics, sudden onsets clearly predominate. They represent one-half of the cases at least and more than one-half, if one takes into account my preceding remarks.

The sudden onset may affect a variety of clinical features, which may be conveniently classed under the four following heads:

1. In a large number of cases, it has the appearance of an *acute pulmonary or pleuro-pulmonary episode*. Chills and fever initiate it, the fever being generally high, occasionally very high. Pain in the sides, coughing, expectoration, are always present; the sputum may be rusty, as in ordinary lobar pneumonia. Physical signs are the same as in lobar pneumonia; dullness or flatness, tubular breathing and crepitant râles. But it is a kind of pneumonia which either

aborts after two, three or four days, or on the contrary drags on much longer than the classical nine days, becoming meanwhile more or less atypical.

The clinical picture may also, from the beginning, differ more or less from true lobar pneumonia and is then identical with those ill-defined syndromes which go under the names of pulmonary congestion, grippe, spurious broncho-pneumonia, dry pleurisy, and so on.

On the whole, the cases in which acute symptoms of lung-involvement occur make up for one-half of the sudden onsets, or 25 per cent of the total in Dr. Blanche's statistics.

2. In a lesser proportion of cases, namely 12 per cent, the onset is marked by symptoms closely similar to those of an *acute catarrh of the upper air-passages* and goes under the name of an ordinary febrile cold or of an attack of "flu"; coryza, sore throat, rhino-pharyngitis, catarrhal laryngitis, tracheo-bronchitis. When the cold is over, there remains a persistent morning cough with a very moderate amount of sputum, and the patient goes on feeling a little out of sorts, running a slight evening temperature, and losing weight.

3. In a very small proportion of cases (1.5 per cent) the symptoms point in no way at first to a respiratory disease. The sudden onset of fever is accompanied by *digestive troubles*; pain in the stomach and intestine, nausea, vomiting, diarrhoea. One thinks of typhoid or food-poisoning. After some days only, coughing sets in and draws attention to the chest.

4. And, finally, we have 11.5 per cent of our sudden cases in which *chills and fever*, loss of strength, muscular pains and malaise are at first accompanied by *no symptoms pointing to any localization at all*. There is neither coughing nor gastro-intestinal disturbance. The fever subsides generally before any precise diagnosis can be made and the whole occurrence is attributed to influenza. But if a complete examination is made at that stage it will often lead to the discovery of extended and already excavated lesions in one lung.

Such are the most usual clinical features which characterize the sudden onset of lung tuberculosis in the adult. If one has the opportunity to make a physical examination of the chest of the patient during that early stage, the signs of pulmonary consolidation are sometimes quite

evident; dullness, impairment or abolition of the vesicular murmur, bronchial or tubular breathing, crepitant or sub-crepitant râles. But the physical signs may be more doubtful, and sometimes even there is really nothing abnormal to be heard. It all depends on the localization of the pneumonic lesion. If it is near the surface of the lung and within reach of the stethoscope and the percussing finger, there is no difficulty. But when it is deeply situated, or adjoining the shoulder joint, it is bound to escape even the most expert stethacoustic examination, whereas an x-ray examination will infallibly discover an extended and often already excavated lesion. And if there is any sputum, bacilli will be discovered in it.

The first stage with its sudden onset may be followed almost immediately by the classical symptoms of manifest phthisis. But it is generally not so. In most instances what takes place after the acute onset is a phase of quiescence or semi-quiescence, which has the rather unfortunate effect of appeasing the anxieties of both the patient and his physician. Fever has subsided, appetite comes back. One speaks of convalescence and even of recovery. The acute episode is checked under one of those uncompromising and misleading heads which are the cause of so many mistakes in diagnosis. There has been no thought of tuberculosis. And yet some very slight symptoms persist, the most constant of them being a little morning cough followed by a very reduced amount of expectoration, so reduced indeed that some patients do not take the trouble of expelling it. Although strength has more or less been restored and work has been resumed, they are easily tired and lack energy. "Since I have had this attack of 'flu', or whatever it may be called, I have never felt quite the same man as before." This one commonly hears from the mouth of such patients. During that phase, the pneumonic lesion has entered a period of shrinking and fibrosis. The solitary cavity or the more or less numerous small cavities which have been formed through the necrotic process of the initial pneumonic phase have emptied their contents and now produce only scanty secretion. This can remain so during several weeks or several months. It can even lead to ultimate healing, the cavity becoming smaller through shrinkage, and undergoing a process of repair. But as a rule this quiescent

phase is sooner or later followed by a renewal of illness, be it that more manifest symptoms and signs of consumption progressively develop, or be it that a new acute episode, more or less similar to the first one, intervenes.

Now let us go back to the initial incident, occurring in perfect health, so suddenly indeed that the tuberculous patient, if properly asked, is often able to say "I fell ill on such and such a day, at such and such an hour." It is, as we have seen, the x-ray examination which enables us to diagnose it with certainty. How then do these pneumonic lesions appear on the fluoroscope or on the film, when they are discovered at their onset?

You may have noticed that, speaking of them, I often used the expression "lobar lesions," "condensation of one whole lobe or of one-half of a lobe." As far back as 1916 I pointed to this usually *lobar* localization of incipient tuberculosis. Since then, and more especially in the years 1921 and 1922, I have endeavoured, in co-operation with my friend Dr. P. Ameuille to make a more detailed study of these lobar localizations which had not as yet attracted attention.

It is a well known fact, demonstrated some thirty years ago by M. A. Bécélère, that the interlobar fissure, which normally is invisible on x-ray films, can be made to appear when it has become thickened as a consequence of some inflammatory process. If the tube is so placed that the normal incidence of the rays goes through the entire length of the fissure, which has an oblique direction from up backwards to low forwards, the thickened fissure will give a straight linear shadow. Now the fissure is commonly thickened in pulmonary tuberculosis, as post-mortems readily show. When the lesions, as is the rule, predominate in the upper lobe, the autopsies show, furthermore, that it is not only thickened but displaced and deformed. The displacement is from downwards upwards, owing to the fibrotic shrinking of the diseased upper lobe, and it may drag the fissure to a very high level. The deformation converts the plane flat surface of the fissure into a dome-shaped surface with its convexity turned upwards. This is brought about by the fact that the shrinkage process is more pronounced in the central than in the peripheral parts of the lobe. Also, adhesions must be taken into

account which fix the lateral end of the fissure to the chest wall and therefore prevent the ascending movement of the fissure from being evenly distributed. Both displacement and deformation of the fissure are seen very frequently and very distinctly on the fluoroscope in cases of pneumonic tuberculosis such as I have described. If displacement predominates, one generally sees on x-ray examination a marked condensation of the greater part of the upper lobe with a sharply defined inferior limit. This limit is straight; its medial end corresponds to the upper part of the hilus; its external end is more or less high up in the axilla, sometimes adjoining the shadow of the clavicle. If deformation predominates, the sharp inferior limit is shaped like an arch, the convexity of which is directed towards the condensed upper lobe. This is how it is seen on front view, and may be called the frontal incurvation. But there is also a sagittal incurvation of which we become aware by examining our patient sideways in a profile view. It has the shape of a long drawn curve uniting the upper posterior to the lower anterior chest wall. Its convexity is also turned upwards. If one figures the way the normal incidence the x-rays must take from back to front in order to bring about the shadow of the fissure, it is easily understood that the fissure being curved, the rays traversing tangentially the convex part of the curve which is nearest the horizontal will cast a definite shadow underneath which condensations will show, as if they belonged to the lower lobe, whereas they really belong to the antero-inferior part of the upper lobe. If, therefore, the x-rays show us an upper lobe which is condensed and shrunk with a sharply defined curved inferior limit, and if we see underneath it the shadows of condensed pulmonary foci, it does not necessarily follow that the process has extended from the upper to the lower lobe. It may just as well be entirely confined to the upper. A profile view will help us in discriminating between both possibilities.

Now, my point is that in the greater number of patients whom we have an opportunity to x-ray soon after a pneumonic onset, we find that the involvement is *lobar* in its localization. The lobe may be condensed entirely. Often, one-half or two-thirds of it only are affected, but then the part of the lobe which remains

free is generally the apex. The rule is that the condensation shows evidences of lobar limitation, the sharp outline of the fissure making the demarcation. This means that the tuberculous lesions of the initial episode are not located on either side of the fissure; they do not trespass over the interlobar frontier. The inferior lobes at this stage are entirely devoid of any lesions. X-ray examination during life shows this clearly. Autopsies are exceptional at this stage of the disease, but when it happens that the patient dies during this first episode, the clear-cut limitation of the lesions to the upper lobe can be demonstrated post mortem. Furthermore, if one applies to such cases pneumothorax treatment at once (and I think it is the proper thing to do) one is often enabled to make out beautifully on the fluoroscope, or on the x-ray film the striking contrast between the diseased, collapsed, shrunk, utterly dark, upper lobe and the perfectly transparent sound lower lobes. If the fissure is not adherent (and often, though thickened, it is not) one may even see an open gap between the two lobes.

The lobar limitation of the tuberculous lesions will generally be overlooked, if one satisfies oneself with films taken according to a standardized technique, applied indiscriminately to all the cases. If, on the contrary, the film is taken only after a preliminary fluoroscopic examination which enables us to choose the position of the tube which shows best the fissural limit, one cannot escape noticing it. In most French tuberculosis centres, fluoroscopy is considered as an essential component of very routine physical examination of the chest; and it is probably the reason why the findings which Ameuille and myself have demonstrated were so readily confirmed by many French observers, especially by Prof. Léon Bernard and Prof. Sergent who made valuable contributions to that question. Prof. Léon Bernard even coined the name "*lobitis*," which soon became a pass-word among us, to designate this special form of tuberculosis, with which we have become familiar during the last eight years at least.

Lately, since 1925, and especially in the last two years, German literature has been discussing widely (and I am sorry to say, without any reference to the earlier French researches)

what they call "infra-clavicular infiltration" or early infiltration with sudden onset or also "Assmann's focus," from the name of the German clinician who they claim discovered it. They very appropriately consider these infra-clavicular infiltrations to be the most ordinary initial form of common chronic consumption. They describe them as being extensive from the beginning, precociously excavated, belonging to the exudative or pneumonic type, and in sharp contrast with the strictly apical, productive lesions which run a slow, torpid, and ordinarily benign course. It is indeed noteworthy and gratifying to see the German school arriving independently at an idea so much like ours about the real nature of incipient tuberculosis. There are only two objections to be made regarding their description of the infra-clavicular infiltration. Firstly, the notion of it originated not in Germany, but in France, and therefore it does not deserve the name of "Assmann's focus;" and, secondly, they have missed what is, in my mind, a very important feature of the whole complex, namely its lobar character. If they had looked at it more closely, they would have seen that what matters really is not whether the apex is or is not involved, but whether there is or is not inter-lobar limitation. There are, as I said before, condensations of the entire upper lobe, apex included. There are also condensations which affect only the inferior part of the lobe adjoining the fissure. And, finally, in exceptional cases the condensation is limited to the median right lobe or to one of the inferior lobes. All of them belong to the same type.

What is true in a general way is that these extensive or partial forms which are due to the pneumonic, exudative type of tuberculosis contrast with the slight nodular (or if you like exudative) forms, which ordinarily affect the apex only. It is often exceedingly difficult to make out the onset of the latter, because they are anatomically and clinically insidious. They are quiescent for prolonged periods, remain unchanged for years, have a natural tendency to spontaneous healing and calcification, and do not much endanger life. The lobar pneumonic form, on the other hand, has a sudden onset and represents the most common beginning of chronic consumption. Their course is characterized by a succession of more or less

acute attacks, each of them being the symptomatic expression of a pneumonic lesion invading a new territory of lung tissue. If such forms are not arrested in time by some procedure of lung collapse, they sooner or later lead to death. This, of course, is only a schematic outline and should not be taken as absolute rule. Nodular apical lesions may be occasionally the origin of an acute lobar process after having remained quiescent during a long period. Conversely, typical lobar processes may eventually take a favourable course and heal completely without the aid of artificial collapse. And finally, as Dr. Ameuille and I have pointed out, the most typical nodular lesions are probably the outcome of small, limited and abortive pneumonic (or exudative) lesions.

Neither can one say that the type of clinical onset invariably represents a definite type of anatomical onset.

If you read Dr. Blanche's book you will see that his clinical histories of sudden onsets are generally accompanied with a radiogram showing a typical lobitis. And yet there are some of those typically lobar films which belong to histories of a progressive or insidious onset. Also, one may see sudden onsets with lesions not extensive enough to deserve the name of a lobitis. Furthermore, it is not always possible to find out the real features of the onset in patients with a poor memory or a poor intelligence. And finally a radiogram may be misleading as to the presence or absence of an interlobar limitation, if it has not been taken after a careful fluoroscopic examination.

The following figures given by Dr. Blanche must, therefore, be regarded as giving only an approximate idea of the real facts. Among 200 tuberculous patients which he studied under my guidance, 107, or 53.5 per cent, had massive lesions with a sharp interlobar limit; 71 in the upper right lobe, 34 in the upper left, 2 in the lower left. On the other hand, 64 per cent of the sudden onsets had a lobar type of disease. For my own part I am convinced that the correlation between the lobar lesions and the sudden onsets will come out more and more distinctly from more extended statistics, taken with due consideration of the facts which I have been trying to describe.

Such correlation we can even find in the data published by observers who had not clearly

understood that the extended lesions with sudden onset are lobar in their localization. For instance, let us take the statistics recently published in a paper by Douglas, Pinner and Wolepor,¹⁴ of the Detroit Municipal Sanatorium, inspired by the German idea of infra-clavicular infiltration with no reference to its lobar character, they have studied 200 patients and found among them 52 per cent with sudden onsets, a figure strikingly in accordance with the 48 per cent of Dr. Dudan and the 50 per cent of Dr. Blanche. The American writers, after a very minute and painstaking analysis of their statistical figures, conclude as follows: "Progressive and destructive pulmonary tuberculosis usually begins *suddenly*, with *exudative subapical* lesions. Strictly apical productive tuberculosis is not, as a rule, the incipient stage of progressive and destructive pulmonary tuberculosis. It may precede the latter, but even in such cases the latter starts usually as stated before. The rôle which apical tuberculosis plays in phthisiogenesis is rather insignificant as compared to that of subapical acute infiltrations. Lesions far advanced as to extent, and excavations, frequently develop within less than six months. Processes leading to active progression and to excavation are most frequently associated with acute symptoms. Apical involvement is, in the majority of patients, not an occurrence of incipency but a late development. Diagnostic and therapeutic endeavours must be directed primarily toward the acute subapical processes and not toward the insidious apical disease.

Physical signs and symptomatology, traditionally described as characteristic for "incipient pulmonary tuberculosis," are misleading for the detection of truly incipient subapical acute processes."

One could hardly wish for a more complete confirmation of the views which Dr. Ameuille and I published in 1921 and 1922. It is true that the American writers speak of the extended and excavated lesions as forming in less than six months, whereas we spoke of a few days only. This apparent discrepancy is easily accounted for by the fact that their survey included only sanatorium patients whose initial episode went back generally to several months previous to their admission. We, on the contrary, have observed dispensary and hospital cases generally very soon after

the onset. If we substitute for the terms "acute subapical infiltration," which is synonymous with Assmann's "early infra-clavicular infiltration," the term "acute condensation with lobar limitation," which is more accurate and more in accordance with the real facts, we shall find ourselves in complete agreement with our colleagues from Detroit. I think, as they do, that the notion of this hitherto overlooked type of tuberculous disease (although it is really the most frequent) has important practical bearings. First of all, it must and can be diagnosed early. And it will be diagnosed early when practitioners will have acquired the habit of thinking that acute respiratory processes or undiagnosed febrile episodes must always raise the suspicion of tuberculosis and therefore be the occasion of an x-ray examination of the chest and a sputum analysis.

Furthermore, if early diagnosed, this most common type of tuberculosis will also be early treated. One should keep in mind that in this particular form of tuberculosis early collapse therapy achieves its most striking successes. Among Dr. Blanche's 200 patients, 173, or 86.5 per cent, had one-sided lesions. Tuberculosis is seldom bilateral from the onset, and the number of cases which would recover if collapse was initiated in due time much greater than one generally supposes. But we must not overlook the onset.

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THE USE OF VITAMINS A AND D AND SODIUM IODIDE IN THE PRE-OPERATIVE TREATMENT OF GRAVES' DISEASE*

BY ROY H. FRASER, B.A., M.D., AND A. T. CAMERON, D.Sc., F.R.S.C.,

Winnipeg

AT the suggestion of Dr. I. M. Rabinowitch, Messrs. Ayerst, McKenna, and Harrison prepared a mixture of vitamins A and D (a concentrate from cod-liver oil), with which was incorporated iodized jecoleic acid, $\text{CH}_3 \cdot (\text{CH}_2)_m \cdot \text{CHI} \cdot \text{CHI} \cdot (\text{CH}_2)_n \cdot \text{COOH}$. This was given the trade name of "Vitiodum" (Forte) and put up in the form of gelatine capsules. Each capsule contained 0.03 gm. of iodide (combined in the fatty acid), the equivalent of that present in 10 minims of Lugol's solution. Both Dr. Rabinowitch, and Dr. E. H. Mason obtained good results with this preparation in the pre-operative treatment of Graves' disease.

A year ago Adamson and Cameron communicated to this *Journal* a study of the effect of the preparation¹. They draw the following conclusions:

"Vitiodum, a combination of vitamins A and D and an iodo-fatty acid, is as effective as Lugol's solution when administered in Graves' disease, its beneficial action, and the limits of its beneficial action, closely resembling those of Lugol's solution. Vitiodum has not, in our experience, produced any gastro-intestinal disturbances during or following its administration. It is probable that neither the vitamins nor the iodo-fatty acid alone are effective. . . . It remains to be determined whether both A and D or but one of them is necessary, and whether the iodized jecoleic acid can be satisfactorily replaced by iodides and other types of iodine compounds."

They emphasized the desirability of further work to investigate as widely as possible the relation between the vitamins concerned and thyroid and iodine metabolism.

In this paper we report results indicating that sodium iodide is as effective as an iodized fatty acid as a medium for conveying iodine in association with the two vitamins for satisfactory pre-operative treatment of Graves' disease.

In investigations of this nature we regard it as essential that the patient be in hospital and under complete control, that he should not have had treatment with Lugol's solution for at least several weeks previously (and preferably not at

all), and that only cases with a clear picture of Graves' disease be treated, since there is still conflict of opinion as to whether or not Lugol's solution itself is beneficial in cases of so-called toxic adenoma. The second of these desiderata is not easy to secure, since at present treatment with Lugol's solution appears to be the routine initial procedure with every presumptive case of Graves' disease.

Hence, we are only able to report on four cases. The definite results obtained, however, seem to justify this report. A fifth case is mentioned as a further illustration of the fact that when Lugol's solution has been continued beyond the point of lowest fall of basal metabolic rate, and the latter has again risen to a high level, *immediate* substitution of vitamin-iodide (or iodized fatty acid) for the Lugol's solution does not produce any beneficial change.

The vitamin capsules used for these cases contained 1250 units of vitamin A (U.S.P. technique of measurement) and 250 units of D (technique of McCollum, Simmonds, Shipley and Park). The dosage was one capsule, three times a day. The iodide was given in aqueous solution. Since iodine is excreted more rapidly when given as iodide than as iodized fatty acid, six doses were given daily, each containing 0.035 gm. of sodium iodide (equivalent to 0.03 gm. iodine). Analysis of the vitamin capsules by Kendall's procedure showed complete absence of iodine from them.

In the case reports which follow only those data pertinent to the subject of this paper are detailed.

CASE 1

John D., aged 29. He was admitted to the Winnipeg General Hospital in April of this year, showing all the clinical signs of Graves' disease, including very marked exophthalmos, this being the outstanding feature. The condition was of 3 to 4 years' standing. Fibrillation was absent and there had been no abnormal loss of weight. There was occasional diarrhoea. After the determination of the basal rate which was +81 per cent, he was the same day placed on the treatment and his progress is shown in the following Table.

* From the Department of Biochemistry, Faculty of Medicine, University of Manitoba.

TABLE I

Date	Weight lbs.	Basal Metabolic Rate per cent
April 16	126	+81
20	126	+64
23	126.5	+51
26	129	+43
29	129	+31
May 2	129.5	+19
6	133	+17
9	134	+14
13	135	+24
16	136	+32

He showed a definite clinical improvement, commencing on April 19th and continuing. He was kept in bed throughout. His pulse rate, initially varying between 90 and 110, showed the same type of fall as that described for patients under vitiodum treatment in the paper by Adamson and Cameron. It was observed that by May 3rd he could sit up in bed and play poker without an increased pulse rate. His temperature was practically normal throughout.

Dr. J. E. Lehmann performed a bilateral resection of the thyroid on May 17th and the patient made an uneventful recovery.

Dr. Wm. Boyd made the following pathological report: "Macroscopic: both lobes of a moderately enlarged diffuse thyroid presenting a colloid appearance. Microscopic: areas of marked epithelial hyperplasia alternating with areas of dilated acini filled with dense colloid."

CASE 2

Wm. E., aged 33. Moderate enlargement of both thyroid lobes, and marked enlargement of the isthmus. No exophthalmos. Fine tremor. General, but not marked, symptoms of Graves' disease. He had lost some weight during the previous year. A basal metabolic rate test, carried out on September 19, 1928, gave the figure +30 per cent. He was admitted to the Winnipeg General Hospital on April 2nd, and the treatment was commenced on the 4th. He was ambulant throughout the treatment. The results are shown in the following table.

TABLE II

Date	Weight lbs.	Rate per cent	Treatment
April 4	155	+36	A+D+NaI daily.
12	158	+12	
14	Treatment discontinued.
19	161	+18	
24	163	+21	
30	164	+38	A+D+NaCl daily.
May 4	164	+39	
7	164.5	+35	
10	165	+40	A+D+NaI daily.
13	165	+42	
16	166.5	+33	
20	168	+23	
23	169.5	+20	
30	169	+14	

He had had no treatment with Lugol's solution since November, 1928. During the periods of treatment with vitamins and sodium iodide he showed no marked clinical change, but became definitely less nervous. While this treatment steadily lowered the basal rate (though more slowly the second time) treatment with the vitamins and sodium chloride (a somewhat larger dose, 10 grains six times a day) produced no such effect.

Dr. J. A. Gunn performed a bilateral resection of

the thyroid on June 1st, and the patient made an uneventful recovery. On the 11th his basal rate was +2 per cent, and his weight 161.5 lbs.

Dr. Boyd's pathological report reads: "Macroscopic: A large diffuse goitre; microscopic, a very resting picture with no hyperplasia."

CASE 3

Wm. R., aged 50. This patient was first admitted to the Winnipeg General Hospital on May 1, 1924, (aged 45). His basal metabolic rate on the 3rd was +93 per cent with a weight of 118 lbs. Treatment with Lugol's was instituted and on the 14th the rate was +35, and on the 26th, +23 per cent, (weight 118.5 lbs.). On the 27th a bilateral resection of the thyroid was performed by Dr. Gunn, five-sixths of the gland removed, including the isthmus, the patient made a satisfactory recovery, and was discharged on June 13th. The pathological report stated: "A colloid appearance, and microscopically dense colloid, with localized areas of hyperplasia."

He was re-admitted on April 2nd of this year, stating that he had been well until six months previously, and had since then lost 35 lbs. in weight. He had taken Lugol's solution, but not within five weeks of admission. At this time the thyroid showed an apparent slight enlargement, there was marked exophthalmos, and a somewhat lessened sugar tolerance. The treatment with the vitamins and sodium iodide was instituted on April 5th and continued till the 17th. On the 7th, by mistake, two doses of Lugol's solution, each 10 minims, were given. The vitamin-iodide treatment led to a definite lowering of the basal metabolic rate as the following figures show.

TABLE III

Date	Weight lbs.	Basal Metabolic Rate per cent
April 5	110	+37
12	111	+29
17	112	+15
24	114	+16

He showed a corresponding clinical improvement. He was discharged from hospital on the 26th.

CASE 4

Harry A., aged 30. He was admitted to the Winnipeg General Hospital in May, showing definite symptoms of Graves' disease, including fine tremor and exophthalmos, though the thyroid was not palpable. Treatment was commenced on May 24th. The results are shown in the following Table:

TABLE IV

Date	Weight lbs.	Basal Metabolic Rate per cent
May 21	113	+68
30	113	+43
June 3	113	+42
6	115	+32
10	116	+32

There was corresponding clinical improvement. Thus, on June 7th, the attending physician noted that the general symptoms were improved, there was little tremor, the pulse was 70, and he was less nervous. On June 13th a bilateral resection of the thyroid was performed by Dr. Gunn. The patient made a steady recovery.

The pathological report states: "The thyroid tissue is quite firm, having the appearance of skeletal muscle cut in cross-section. Microscopically, the gland is in a resting state but shows small areas of hyperplasia."

CASE 5

Leslie O. This patient had had Graves' disease for several years, and with marked symptoms for the previous eighteen months. He had been treated with Lugol's solution from April 14th to May 13th. The basal rate fell, but not to a point sufficiently low to render operation desirable. Increasing the dosage produced no better result. Lugol's solution was discontinued for twenty-four hours, and the vitamin-iodide treatment then commenced (May 14th). The results, which seem to be non-beneficial, are shown by the following figures:

TABLE V

Date	Weight lbs.	Basal Metabolic Rate per cent
May 14	141	+89
17	143	+76
20	146	+85

The treatment was thereupon discontinued.

DISCUSSION OF RESULTS

The results with Cases 1 to 4, compared with those reported by Adamson and Cameron, show clearly that replacement of iodized fatty acid by sodium iodide produces equally beneficial results. The combination of iodide and the two vitamins would appear, like vitiodum, to be of equal value with Lugol's solution in the pre-operative treatment of Graves' disease. The therapeutic problem would therefore seem to be the selection of that iodine compound which can be most conveniently administered with the vitamins.

Case 2 is, in addition, a useful control, providing further evidence that the two vitamins alone (since of course the effect of the sodium chloride solution can be neglected) are without effect. Case 5 indicates, as did Case 9 of the earlier series, that a period of probably some weeks without medication is necessary if the

combined vitamin-iodide treatment is to be applied after too prolonged administration of Lugol's solution.

In none of the cases was any gastro-intestinal disturbance produced by the treatment.

We are indebted to Dr. William Boyd, for the pathological reports. He states that the pictures are essentially similar to those seen in thyroid material from cases of Graves' disease after treatment with Lugol's solution.

It is now necessary to determine whether both of the vitamins, or which one of the two is necessary, to produce the beneficial action that has been demonstrated. We propose to attempt to solve this problem as the next step.

Our results have, of course, no bearing on the post-operative treatment.

SUMMARY

A combination of vitamins A and D and sodium iodide produces the same beneficial effect as "vitiodum" and as Lugol's solution in the pre-operative treatment of Graves' disease.

Some further evidence is provided that the vitamins alone are without action.

We desire to thank Drs. J. E. Lehmann, F. A. Young, F. A. Benner and A. W. S. Hay for permitting us facilities for this work and for their co-operation.

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REFERENCE

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PROPER SHOEING OF THE CHILD.—John D. Adams insists that parents should be educated not only with regard to the proper type of shoe to be worn by the child in early life but also in an intelligent understanding of its construction, and of the reasons why the growing foot should be respected in its anatomical development. The first shoe should emulate a paper bag, possessing just enough shape to make it possible to designate it as a shoe. Its material should be soft white kid with a flexible unresisting sole, with a draw string of tape at the top. Its function should simply be that of a protecting covering. Between the ages of 2 and 5, the child should have something a little more substantial as a protection. There are seven vital and essential points to be incorporated in what might be termed the "ideal seven point shoe": 1. Breadth of toe. The shoe should be sufficiently broad to allow the toes to assume a natural uncompressed weight-bearing posi-

tion. 2. Length. All shoes should be at least one-half inch longer than the weight-bearing foot. 3. Depth and fulness of the toe. 4. Close fitting well shaped heel, tapering at the top to fit the natural conformation of the os calcis. 5. Depth from the ramp at the dorsum of the foot over the midtarsus to the sole. Depth and fulness are necessary here, not only to accommodate the normal fulness in the contour of the foot but also to allow freedom of action in foot mechanics, in raising on the toes in the act of walking. There must be a lack of constriction at this point to allow a proper bearing and leverage of the toes. 6. Broad flexible sole, with a straight outside bearing from the tip of the little toe to the width of the heel. 7. Height of the heel. Starting with the "paper bag shoe," up to the age of 3½ years, the child's shoe should not have a heel any thicker than the sole. From 3½ years up to 5 years, the heel should be twice as thick as the sole.—*J. Am. M. Assn.*, 1929.

THE EFFECTS OF IODINE TREATMENT, WITH AND WITHOUT VITAMINS, ON THE BASAL METABOLIC RATE IN EXOPHTHALMIC GOITRE*

By I. M. RABINOWITCH, M.D.,

Montreal

IT is now generally recognized that individuals suffering from exophthalmic goitre benefit from the use of iodine. Of this there is both clinical and laboratory proof. Following the administration of iodine there is noted a decrease of the severity of the signs and symptoms of the disease, the basal metabolic rate decreases, and operative measures are rendered more safe. Though Lugol's solution appears to be the form in which iodine is generally given, other iodine-containing mixtures and compounds have been used with, apparently, equally good results. Occasionally, all forms of iodine treatment fail. As a matter of fact, iodine may not only fail to relieve, but may actually intensify, the signs and symptoms of the disease.

The mechanism of the action of iodine in this condition and the relationship of iodine to thyroid activity in general are, as yet, unknown. Proof of this may be found in the numerous theories advanced, many of which are unsupported by experiment. A prevalent explanation of the beneficial effects of iodine in exophthalmic goitre is that such individuals have an insufficient supply of this element. Though there appear to be data to support this view, it is rather difficult to reconcile it with certain known facts. One of the characteristics of iodine is the marked disproportion between its importance in the human economy and the amounts required for functional purposes. According to available data a little over one milligram a day appears to suffice. Opposing this view is also the finding that, at least as far as the thyroid gland itself is concerned, such individuals do not seem to lack iodine, and when iodine is given, the gland may be found to contain enormous quantities of it, but, in spite of this, the basal metabolic rate may remain high. This is shown in Table I which represents a series of analyses of thyroid glands made in this laboratory with regard to their iodine contents.

The data show that whether the thyroids were from patients with, or without, hyperthyroidism, the amounts of iodine, both per gram of dry tissue and per gland, were at least equal to those found in tissues of non-goitrous individuals. This also applied whether the thyroids from the patients with hyperthyroidism did, or did not, contain adenomata. As a matter of fact, the values corresponding to the total amounts of iodine recorded here, with the exception of the normal glands, are, in many cases, much below the true values. The normal material was obtained at autopsies of individuals without goitre, and it was thus possible to obtain the total amount of thyroid tissues in each case; whereas, the diseased tissues represented operative material, and in no case therefore, was it possible to obtain the complete gland. In addition to this, in some instances, half or more of the material which was removed at operation was not available for chemical analyses, having been sent to the pathologist for his examination.

The tissues obtained from the patients with exophthalmic goitre are of particular interest. Though some of the patients represented here with non-toxic goitre, and those with hyperthyroidism, with adenomata, received iodine, the amounts given were extremely small. The patients with exophthalmic goitre, however, received large quantities of this element. It will be noted in these cases that not only were the values corresponding to the milligram of iodine per gram of dry tissue greater than the normal, but also those corresponding to the total amounts, and, at the same time, the basal metabolic rates were increased. Two cases are particularly of note. The total amounts of iodine per gland were 141.3 and 121.4 milligrams respectively, and the corresponding basal metabolic rates were +36 and +56 per cent.

The technical details of the iodine determinations were previously described,¹ and, for brevity, will not be repeated here. It may, however, be stated that with this method it is pos-

* From the Department of Metabolism, the Montreal General Hospital, Montreal.

TABLE I.
IODINE CONTENTS OF THYROID GLANDS

Type	Not Treated with Iodine				Treated with Iodine			
	Dry weight (gms.)	Iodine		B.M.R.	Dry weight (gms.)	Iodine		B.M.R.
		Mgrm. per gm. dry tissue	Total mgrms.			Mgrm. per gm. dry tissue	Total mgrms.	
Normal (complete gland)	4.63	1.32	6.11					
	6.32	1.64	10.36					
	8.27	1.00	8.27					
	5.34	1.47	7.85					
	5.57	1.05	5.84					
		1.29	7.69					
Non-Toxic Goitre (incomplete gland)	8.42	1.69	14.23	-4	6.42	1.37	8.79	+5
	6.54	1.31	8.57	+6	8.36	1.42	11.87	+8
	12.16	0.74	9.00	+10	11.34	1.24	14.06	+3
	9.32	1.09	10.15	-1	3.57	1.61	5.75	+9
	4.16	0.78	3.24	+2	7.28	1.08	7.86	+10
		1.12	9.04			1.34	9.66	
Toxic Goitre with Adenoma (incomplete gland)	8.42	0.86	7.24	+42	9.56	1.32	12.92	+59
	6.85	0.69	4.73	+30	4.96	1.42	6.04	+36
	5.42	1.05	5.69	+60	5.30	1.56	8.26	+45
	3.25	1.35	4.39	+51	6.01	1.61	9.67	+38
	6.57	1.35	8.87	+22	5.47	0.81	4.43	+29
		1.06	6.18			1.34	8.26	
Exophthalmic Goitre (incomplete gland)	6.12	1.12	6.85	+38	17.47	8.11	141.3	+38
	3.84	1.02	3.91	+44	6.62	3.50	23.2	+42
	7.15	0.65	4.65	+68	21.72	5.59	121.4	+56
	5.75	1.34	7.70	+41	5.59	2.82	15.7	+32
	5.25	1.81	9.50	+57	10.30	2.61	26.8	+25
		1.18	6.52			4.52	65.7	

sible, with proper care, to recover as much as 150 milligrams of added iodine with an error of 0.2 milligrams, an accuracy sufficient for the present purposes. In all of the cases the basal metabolic rates recorded represent those found just prior to thyroidectomy.

These data appear to demonstrate definitely that lack of iodine is if at all a factor not the only one responsible for the clinical signs and symptoms of exophthalmic goitre, in spite of the fact that the administration of iodine leads to improvement. The recent observations of Williamson and Pearse² are of interest here. These authors have shown that there is no absolute lack of iodine in Graves' disease, but that a relative lack may complicate the picture; and that though the relative lack of iodine may be relieved by iodine feeding, its effect on the thyrotoxicosis is not yet clear. This conclusion was based upon the demonstration of the existence of at least two factors which are concerned with thyroid physiology, namely, (a) a secreting function, and, (b) an iodo-colloid function; and these are not mutually derivative.

The above observations lead to the conclusion that factors other than iodine must be considered in the etiology of exophthalmic goitre. Many have been suggested, and amongst them is vitamin deficiency. That vitamins may be concerned with the metabolism iodine was shown by McCarrison.³ More recently, and further suggestive, are the observations of Harvey.⁴ This author has shown that cod liver oil when fed to goats causes the passage of more iodine into their milk than when equivalent amounts of potassium iodide and olive oil are fed.

That vitamins are concerned with the metabolism of inorganic elements hardly requires further proof. Interesting here, particularly, are the recent observations of Harris and Moore⁵ with regard to phosphorus and calcium. These authors have shown that lack of vitamin D leads to a deficiency of phosphorus or calcium, or both, and to defective calcification, whereas, excess quantities of vitamin D result in an opposite picture, namely, excess quantities of calcium or phosphorus, or both, and excess calcification. Other such examples could be cited. It is, there-

fore, possible that in hyperthyroidism we are dealing with a somewhat similar situation with regard to iodine. Iodine deficiency, in spite of excess quantities found in the gland, could then be explained. An analogy is suggested in the relationship between the calcium content of blood and the bleeding time in cases of jaundice. In this condition, the bleeding time, as is well known, may be prolonged, and an administration of calcium may shorten it. In spite of the prolonged bleeding time, however, the calcium content of such bloods is always invariably found to be normal. In other words, though a normal amount of calcium may be present in the blood, it is not all available for clotting purposes. The present view is that in such cases the calcium is bound with the excess bile pigments.

The fact that the administration of iodine alone leads to improvement of the patient in many cases does not oppose the idea of vitamin deficiency. Numerous analogies may be found in the metabolism of man. At any rate, iodine does not cure, nor does it control all of the disturbances in, Graves' disease; the beneficial effects which may result from its administration are not permanent and, finally, it may, at times, aggravate, rather than alleviate, the condition.

In view of the above observations, the writer had prepared a mixture of vitamins A and D in high concentrations in combination with an iodo-fatty acid. Clinical experience with it seemed to suggest that it was not only as effective as Lugol's solution, but that it was superior to it. These results, because they were few in number, were not published. Adamson and Cameron⁶ acting upon this suggestion (personal communi-

cation) made somewhat similar observations. According to these authors it also appeared that there was some positive vitamin reaction and that both the vitamin and iodized fatty acid fraction were necessary.

Because of the above results, the writer had prepared a mixture, in capsule form, with much greater concentrations of vitamins. Each dose given corresponded to the following:—

Vitamin A	1250 units
Vitamin D	250 "
Iodine	30 mgrm.

Some idea of these dosages of vitamins may be gained from the amounts of the following common articles of diet approximately necessary to yield corresponding amounts of vitamin A.

Apples (raw)	100 oz.
New cabbage (raw)	100 "
Orange juice	80 "
Lettuce	30 "
Fresh milk (whole)	20 "
Green peas	10 "
Fresh butter	3 "
Carrots (raw)	2½ "
New-laid eggs	3 "

To test this product, twelve patients suffering from exophthalmic goitre were selected at random. In each case the above mixture was given twice daily. Basal metabolic rates were determined at regular intervals of four days during the periods of observation. The latter was used as an index of progress, not because other features of the disease are not of equal, or even of greater, importance, but because it is the only feature of the disease which can be expressed reasonably quantitatively. The combined results are recorded in Table 2.

TABLE II.
EFFECT OF IODINE TREATMENT WITH AND WITHOUT VITAMINS ON THE BASAL METABOLIC RATE

Lugol's							Vitiodum						
Iodine (mgms.)			B. M. R. (per cent)				Iodine (mgms.)			B. M. R. (per cent)			
Daily dose	Days	Total dose	Before	After	Total reduction	Reduction per day	Daily dose	Days	Total dose	Before	After	Total reduction	Reduction per day
115	11	1265	96	44	52	4.72	60	13	780	74	14	60	4.61
116	7	812	46	16	32	4.57	60	8	480	62	15	47	5.87
116	7	812	33	11	22	3.14	60	12	720	46	23	12	1.00
58	4	232	59	40	19	4.75	60	13	780	78	27	51	3.92
58	19	1102	69	36	33	1.74	60	10	600	77	43	34	3.40
57	7	406	18	6	12	1.71	60	4	240	79	57	22	5.50
57	14	798	19	5	14	1.00	60	5	500	100+	67	33	6.60
116	6	696	44	26	18	3.00	60	9	540	72	28	44	4.89
115	7	805	48	41	7	1.00	60	5	300	57	40	17	3.40
116	5	580	45	20	25	5.00	60	7	420	61	29	32	4.57
58	8	464	57	9	48	6.00	60	5	300	66	22	44	8.80
58	8	464	60	43	17	2.12	60	5	300	65	43	22	4.40

In order to compare the effects of this mixture with those of Lugol's solution, twelve patients who were treated with Lugol's were selected at random. The results of the treatment in each case were previously reported in this *Journal* by Fitzgerald with regard to a different problem. They are reproduced in Table 2 for comparative purposes only. It will be seen that the average decrease of the basal metabolic rate was 3.2 per cent per day with Lugol's solution and 4.7 per cent with the mixture of iodized fatty acid and vitamins. It is interesting to note that much less iodine was given with the vitamin-containing mixture than when Lugol's solution was used.

As with all biological experiments, there are a number of inherent difficulties in the interpretation of the results. This is because of variables, some of which are recognized and difficult to control, while the existence of others may not even be suspected. One means of reducing the effects of such variables is to treat the data statistically. One must, however, have available a much larger series of experiments, in order to attach significance to the results. However, to eliminate one source of error as much as possible, the groups compared were made as similar as is possible clinically. In each case the diagnosis was the same and the treatment was alike in every respect, except for the iodine medication. The clinical and pathological diagnosis was exophthalmic goitre only, and the subjects were confined to those with smooth, uniformly enlarged goitres, associated with hyperthyroidism and with exophthalmos. The period of observation in each case was from the first day iodine was administered to the end of the first interrupted fall of the basal metabolic rate.

In the accompanying chart the results of two other experiments are graphically reported. Unfortunately, it is almost impossible to obtain many such data, since, recently, practically every patient admitted to the hospital with a diagnosis of exophthalmic goitre has been given iodine beforehand. These two experiments are reported, therefore, not because the writer is convinced the results would apply to a larger series, but to suggest the possibility, in order that such experiments may be repeated by others with similarly available material.

In the first case, it will be noted that the

basal metabolic rate before treatment was +78 per cent on admission. Ten days later there was evidence that the basal metabolic rate had become stabilized and that the maximum effect from bed rest was obtained. Lugol's solution was then given. With this treatment, the patient received 130 mgm. of iodine per day. At the end of twenty days the basal metabolic rate had dropped to +57 per cent and on the twenty-fifth day it appeared there would be no further drop. As a matter of fact, the basal metabolic rate was then +59 per cent. One of the above-mentioned capsules was then given twice a day. The total daily dose of iodine corresponded to 60 mgm. A further drop in the basal metabolic rate occurred, reaching its lowest level on the fortieth day at +50 per cent. The basal metabolic rate thereafter began to increase, a result not unlike prolonged treatment with all other forms of iodine.

In view of the above result, an attempt was then made to determine whether the vitamin combination, with an amount of iodine equal to the normal daily demands, would have any effect. On the first day of observation, the basal metabolic rate was +85 per cent. At the end of ten days the basal metabolic rate had apparently reached its lowest level with bed rest. It was then +69 per cent. On the fifteenth day there appeared to be evidence that the maximum effect from bed rest was obtained, and, again, as in the first case, the basal metabolic rate tended to be little higher than during the last observation, namely, +71 per cent. Lugol's solution was then given, and, as in the first case, the daily dose of iodine corresponded to 130 mgm. The lowest basal metabolic rate was reached at the end of the thirtieth day at +52 per cent. On the thirty-fifth day it was +55 per cent. Vitamin treatment was instituted. One capsule of the mixture was given twice a day. The daily amount of iodine corresponded to 2 mgm., or, practically, according to available literature, the requirements of the normal individual. Five days later, that is, at the end of the fortieth day the basal metabolic rate had dropped to +41 per cent. On the forty-fifth day it was +42 per cent. Thereafter, the basal metabolic rate commenced to rise and on the fiftieth day it was +45 per cent. Here, there-

may use the ordinary duodenal tube. The intestinal juice thus obtained can then be analyzed for its morphological, chemical, physical, bacteriological, physiological, enzymic and other contents. It can also be examined for normal resorption of digested food, and for pharmacological substances to prove their action upon the intestine or their elimination, and for the therapeutic application of medicinal substances, buffer solutions, bacterial suspensions, etc., in the desired portion of the small or large intestine. It is desirable still to extend the studies so far made with this method, in order to obtain more information about the physiology and pathology of the location and manner in which albumins and their digestive products, as well as the carbohydrates and fats, are absorbed.

The sterility often found in the old bacteriological tests in the duodenum must be regarded with a great deal of doubt, because of the difficulty in the culture of many of the intestinal bacteria in ordinary culture media. Van der Reis and his school^{1,2} have found, by means of the bacteriological intestinal tube, that the small intestine, before eating, is poor in bacteria but not absolutely sterile. In the higher parts of the small intestine I have found, as have other investigators, long and short bacilli, always Gram-positive, lancet-formed diplococci, and, in isolated cases, Gram-negative bacilli. The Gram-positive germs belong to the lactic bacilli, while the Gram-negative are mostly identified with the coli-aërogenes group. In the mid-intestine the flora is more varied. The number of the glycophile cocci is decreased; likewise, although somewhat less, the lactic bacilli. On the other hand, more genuine colon bacilli, and also other Gram-negative bacilli and related groups, appear. The lower small intestinal segment showed an increase of Gram-negative forms over the Gram-positive.

Out of the cæcum, Van der Reis obtained cultures of other types, principally anaerobic, such as *B. bifidus*, *B. phlegmones emphysematosa* (*perfringens* Veillon and Zuber; *saccharo-butyricus immobilis* Schattenfroh and Grassberger), *B. putrificus* Bienstock (*Clostridium butyricum* Prazmowski; *saccharo-butyricus mobilis* Schattenfroh and Grassberger), in addition to the lactic bacilli known

to belong to the intestine. The *B. tetani* is also found in healthy persons to a certain extent.

The fermentative and putrefactive bacteria (often seen producing the two processes together) are the usual peculiar and obligate inhabitants of the intestinal tract of man and all vertebrates. Due to the activity of the juice of the small intestine in the disintegration of the disaccharides and hydrocarbons, a diminution of this juice is necessarily followed by an increase of the fermentation, because the bacteria have more material at their disposal. The rapid emptying of the stomach and the rapid passage through the small intestine of the hydrocarbons, particularly when much cellulose material is present, also contribute to the increase of fermentation. I have found hyperperistalsis and rapid passage in most of my investigated cases manifesting increased fermentation processes in the stool. Several nervous dyspepsias and diarrhœas produce this result also. With the irritation produced by the products of fermentation there soon comes a fermentative catarrh which in a vicious circle predisposes the intestine to hyperperistalsis and fermentation.

I regard as other factors or causes of the pathological fermentation process the following:

1. A continued ingestion of large quantities of vegetable food, rich in cellulose, by persons with a weak intestinal tolerance for such food.
2. Insufficient action of the intestinal contents, or a too speedy intestinal passage.
3. Dyspepsia of all kinds and intestinal catarrh.
4. Abnormal bacteria, usually caused by ascension of bacteria from the lower segment of the small intestine, or from the colon, or because the small intestine is colonized by foreign bacteria, due to insufficient protection by the defensive powers of the small intestine.
5. Primary intestinal putrefactive processes due to a abnormal putrefactive bacterial flora creating intestinal dyspepsia or catarrh.

The disintegration of the cellulose, pectin, and pentosane seems to begin (according to Van der Reis and Henneberg's³ investigations) already in the intestine through the normal bacteria of its lower segments.¹

The decomposition of carbohydrates (glucose, fructose, galactose, mannose), is effected by *B.*

coli, *B. lactis aëronglues*, *B. granulobacter*, *B. butyricus*, *B. pentoaceticus*, *B. prodigiosus*, *B. perfringens*, *monilia torula*, (Ashford), etc. forming the various fermentation products; acetic acid, butyric acid, formic acid, acetaldehyde, alcohol, acetone, carbonic acid, hydrogen, methane, etc., and they differ according to the kind of infecting bacteria. I have found in my analyses several types of fermentation that can sometimes be recognized by their odour. But it is not always possible to demonstrate in the fæces the different kinds of fermentative bacteria.

The most recent studies of von Catel and von Graevenitz^{4,5} have proved that acetic acid and other volatile fatty acids produce increased peristalsis, but lactic acid does not. In normal intestinal chyme, where the regular intestinal bacteria are found (Gram-positive lactic acid bacteria, *bacillus acidi lactici* and *enterococcus lacticus*), I have not found abnormal fermentation products. Wollman and Van der Reis were unable to discover amyolytic and fermentative bacteria in the normal small intestine. These bacteria have their special localization in the lower small intestine, cæcum and colon, and when they wander to other than their own locations, pathological changes are present. The most serious difficulties arise when bacteria which grow with fermentation leave their ordinary location [the so-called "Gaerkessel" (fermentation focus) of Von Noorden] and migrate to the upper parts of the ileum and jejunum, producing chyme infection, or, as Van der Reis says, a wall infection.

It is possible that the ascent of infective fermentation is more important for pathology than the infection itself. This ascent of the fermentative bacteria (especially of *B. coli*, which produces simultaneously fermentation and putrefaction, amylobacter, clostridium) is usually accompanied by diminution of the normal lactic acid bacteria in the small intestine. By the ingestion of these intestinal lactic acid bacteria, or acidophilus and yoghurt* bacteria, in sufficient quantity, it is possible to obtain important therapeutic results

in these fermentative and putrefactive processes.

We believe that greater biological differentiation should be made than is generally done in medical bacteriology between the various milk acid bacteria, especially between those constantly present in the small intestine (*S. and B. lacticus*) and those called by Henneberg⁶ "Wild milk acid bacteria" and "Kultur milk lactic acid bacteria," which form pure milk lactic acid, and the bacteria of fermentation which form acetic acid alcohol, CO, CO₂, aldehyde esters, volatile fatty acids, and so forth. The normal milk lactic bacteria, peculiar to the human small intestine (*S. and B. lacticus*), cannot, according to our investigations, produce the abnormal fermentation products. On the contrary, they seem to be the natural enemies of fermentation and also of putrefaction.

The most practical method of differentiation for clinical purposes between normal fermentation bacteria and abnormal fermenting Gram-positive intestinal bacteria is to test their fermentative power on malted barley infusion beer-wort with juice obtained with the bacteriological intestinal tube. The normal sour milk bacteria coagulate milk with homogeneous uniform coagula and form no gas, whereas the fermentative bacteria and *B. coli* form gas bubbles.

The best culture media for the *B. lacticus* of the intestine are, a malted barley infusion or beer-wort; Kunze culture media; and Henneberg's food solution for lactic acid bacteria; or a culture medium of the following composition (after Henneberg):—

Raw sugar	10	gram.
Ground barley malt (Keime)	1	"
Super phosphate	0.10	"
Calcium phosphate	0.05	"
Potassium biphosphate	0.05	"
Magnesium phosphate	0.05	"
Ammonium phosphate	0.01	"
Ammonium sulphate	0.01	"
Magnesium sulphate	0.03	"
Calcium carbonate	1.00	"

In order to have a simple clinical proof of the antifermentative power of the culture milk bacteria, I have made the following tests. To many persons who could not eat some of the classes of vegetables rich in cellulose, as, for instance, beans of all kinds, cabbage, turnips, etc., I have given several glasses of a strong culture of lactic acid bacteria, cultivated from the small

* Yoghurt is fermented, coagulated milk, used as food extensively in the Balkans and also elsewhere, prepared with three kinds of bacteria, *S. thermophilus acidi lactici*, which gives it a pleasant and characteristic taste; the *B. bulgaricus* and the strong thermus bacterium yoghurt, which can produce 2 to 3 per cent lactic acid from milk sugar. It gives the sour taste to yoghurt.

intestine, or from the three bacteria of yoghurt and kefir, several hours before eating these vegetables. Almost without exception I found that after partaking of this culture of lactic acid bacteria these patients could eat the said vegetables without gas formation and with a marked decrease in dyspeptic troubles. In a few cases where the effect was not plainly visible, but rather the gases seemed increased, I was able to find that these lactic preparations were not fresh enough or had been infected by "wild" lactic acid bacteria or yeast. I did not make these tests with acidophilus milk, but it is possible that this would give the same results. Van der Reis and Henneberg have communicated similar results to me.

THE NATURE OF THE PUTREFACTIVE PROCESSES

The intestinal bacteria, especially when they work in co-operation, break up the albumins just as digestive ferments do, but they can decompose more than these ferments, because they can split amino-acid until it becomes ammonia (one of the last products of putrefaction).

Several bacteria, such as *B. putrificus* Bienstock, can also produce volatile fatty acids (valerianic, caprylic, butyric). Also, besides their enzymatic capacity these bacteria have also the power of decarbonizing and forming alcohol from amino-acids (F. Ehrlich). According to Guggenheimer, the bacteria of putrefaction can produce, for instance, leucinic acid, isocaproic acid, isoamylanin and isoamylalcohol, by dissemination, and isovalerianic acid, by hydrolytic reduction, decarbonization and oxidation. Fermentative and putrefactive dyspepsias are to be treated as endogenous infections. These two processes must not be looked upon as opposites, as it has been proved that the *B. coli* growing in the intestine may cause carbohydrate fermentation or albumin disintegration, according to the actual reaction and the sugar content.

According to my investigations, the main factors of the putrefactive process are the following.

A. A large quantity of soluble albuminous products in the intestine, usually originating from the intestinal wall, caused by irritation of the same by catarrhal infection and a strong fermentative process.

B. Intake of a large quantity of protein food which increases the putrefactive process. This

is not, however, always the case, nor in as large a measure as the factor mentioned under A.

Concerning the cause of the ascension of the fermentative processes into the upper part of the small intestine, it is necessary to bear in mind the diminution of the bactericidal power against the fermentative and putrefactive infections as well as the already named factors involved in the increase of undigested products and possible intestinal catarrh. It is known that the duodenum and jejunum are the portions of the intestine which receive most of the bacteria from the stomach, but yet are the least germ-inhabited parts. Many other writers have thought the jejunum and upper part of the ileum to be sterile, but the investigations with the bacterial tube have proved definitely that lactic acid bacteria, *B.* and *S. acidilactici* are contained there. These lactic acid bacteria are considered normal to these parts. In the lowest section of the small intestine other bacteria begin to live, particularly the coli-aërogenes group.

In my examined persons I have found this to be the normal picture. Concerning the sort of bactericidal powers of these portions several opinions have been expressed (Bienstock, Schutz, Eisklein, Prak, Bogendorf, E. Magnus-Alseleben, Rolly, Liebeneister, Bragstadt, Cash, Croll, Pope, Gomperts, Vorhans, Bas, Eggston, Norman). That the bactericidal powers of the stomach are rather weak is now accepted by many investigators. The flora of the first part of the small intestine is found by Van der Reis and Bogendorf to have approximately the same composition in hyperchlorhydria as in achylia gastrica. We have found some differences.

The bactericidal powers of the small intestine have been found by me to be very strong in an investigated case of chronic lamblia infection of the gall-bladder. In the medical clinic of Professor Straub, at the University of Greifswald, working with Van der Reis, I studied a case of chronic lamblia infection (*giardia intestinalis*) of the gall-bladder for several months. This patient had had much digestive trouble and diarrhoea for many years. The intermittent diarrhoea was diagnosed as small intestinal and pancreatic diarrhoea. The stools contained as their outstanding characteristic large quantities of neutral fats and periodical decreases of bile pigment and diastatic ferments. The coprological and other clinical

explorations did not give the etiological diagnosis. The gastric juice was hyperacid. A study with the intestinal tube demonstrated duodenitis and jejunitis characterized by a great amount of small infiltrated mucous flakes and succorrhœa in the duodenum and jejunum. The bilirubin and pancreatic ferment were present, but variable in quantity. Urobilin was negative (In a special study of urobilin, the results of which study are yet to be published, I have found tests to be positive in the first part of the jejunum and duodenum in all the patients examined). I have found it important that in the first part of the jejunum and duodenum there was constantly present a great quantity of *lamblia intestinalis*. By the trans-duodenal irrigation with magnesium sulphate solution, peptone, or ether, the quantity of lamblia was augmented to a very large degree. But the interest of this observation is that the lamblia in their passage through the small intestine were uniformly killed by their rapid intestinal passage. In the last part of the ileum there were found only isolated examples of the presence of flagellates. I have never found protozoa in the fæces even with the most careful centrifugalization used on the same day in which a large quantity of lamblia were expelled by means of magnesium sulphate introduced into the duodenum. I consider these cases as a proof of the bactericidal power of the intestine, more especially because a severe catarrh of the duodenum and jejunum were present. These cases also show the importance of intestinal exploration with the tube when other means of diagnosis have failed.

I believe that the discovery of the ascent of bacteria from the colon to the upper parts of the small intestine and the colonization of strange bacteria in the small intestine reveals an important cause of a number of chronic diseases, such as chronic fermentation and putrefaction, catarrh of the intestine, gall and pancreatic ducts, acute and chronic intestinal dyspepsia. It is also noteworthy that this ascending infection of the faecal bacteria has been demonstrated as an important factor or cause for pernicious anæmia. (Consult the works of Seyderhelm, Knud Faber, Van der Reis, Bogendorfer, Norowitz, Strassburger, Lohr, Rosell). These are therapeutically important discoveries because these diseases may be treated directly by

irrigation with various therapeutic solutions and bacterial suspensions, etc., through the intestinal tube in conjunction with the usual therapeutic methods.

The coprological analysis or bacteriological study of the fæces never furnishes the diagnosis of these infections of the higher parts of the intestine. Only by the method of Bassler's intestinal bacteriological studies⁷ are we enabled to obtain practical bacteriological knowledge of the lower intestinal flora. In the case of endogenous infection (Van der Reis) we must assume a wall infection of the intestine with *B. coli* which normally would be found only in the lower segments of the intestines.

The colonization of pathogenic bacteria is, however, not to be taken as primary, but as resulting from a changed small intestinal function which is probably due to a disturbance of the secretion of the intestinal juice. The reaction in the intestines of sick persons takes a large part in the etiology. Whether at the same time a real lesion of the intestinal wall is concerned has not been determined.

The results of therapy have confirmed the correctness of these diagnoses. Van der Reis⁸ has proved that after removing a colonization of *B. tetanus* or *S. hæmolyticus*, or an abnormal flora in the small intestine, secondary anæmia was completely cured. After determining the pathological colonization, irrigations were made of the jejunum, ileum and cæcum with physiological salt solution, disinfecting fluids and certain buffer solutions.

For the restoration of the normal flora the missing or repressed *B. lacticus* may be implanted. This kind of bacteriotherapy has been used successfully by employing a growth of the obligatory acid lactic bacteria found in the small intestine of a healthy person. Another factor for the maintenance of a normal colonization of the small intestine presents itself in the actual reaction which prevails in those segments whose change has a vast influence upon the flora.

The studies upon the hydrogen-ion concentration in the intestines were made by Long and Fenger, Meyers and MacClendon, MacClendon, Einhorn, Bissel, Lowe and Meyer, Van der Reis, Schembra, Bogendorfer, Wetmore and Reynolds, Freindenwald and Sindler, Okada and Arai, MacClure, Montague, Campbell, Hudson and Parr. Even though no complete uniformity of

results has been reached (which may partly be traced to the difference in experimental conditions), it has been established that the opinion hitherto accepted as to the intestinal reaction is erroneous. The reaction in the intestine is not decidedly alkaline, but acid. In all my explorations I have found the intestinal juice acid inclusively to litmus paper in the higher parts of the jejunum and ileum. The reaction changes to some degree with the digestion processes. The average hydrogen concentration in the upper intestine is $pH = 6.28$; the central $pH = 6.46$; and the lower 6.79. The value in the upper intestine lies between pH 5.4 and 6.6; in the central one between pH 6.2 and 6.7; and in the lower between pH 6.2 and 7.3, according to a series of investigations made on 63 normal persons. (Van der Reis and Schembra).

The dependence of the bacteria flora of the intestines on the reaction of the environment has also been ascertained recently in a number of publications. They treat of the relation of the hydrogen of the culture media to the various bacteria, their optimal conditions essential to life, and their inhibition by a certain characteristic H-ion concentration. (See Bruenn, Sheer, Adam, Demby, Michaelis, Michaelis and Marcora, Clark, Cannon and MacNease, Van der Reis). It has been demonstrated that by means of the H-ion concentration the bacteria have a more or less narrow growth zone and a pretty sharply defined growth optimum, and that beyond this zone they undergo serious disturbances of the power of multiplying, morphology and assimilation. Adam characterizes the H-ion optimum as the "Specific hydrogen number of the bacteria."

A change of reaction in the intestine, which is noticeable in certain diseases of the intestines, is always accompanied by a change of vegetation type, as has been experimentally proved (Van der Reis).

INDICAN AS AN INDEX OF PUTREFACTION IN THE COLON

In our parallel investigations of the appearance of putrefaction in the faeces and a test of indican in the urine, I have found no regular correspondence of values of these two manifestations: intestinal putrefaction, measured (tested) in the faeces, and the indican test in the urine.⁹

In persons having a high putrefaction value

in the faeces, I found the urine quite normal or with scant increase of indican. I also found the opposite to be true: I hold that the quantity of indican in the urine (except in cases where there is a disturbance of the small intestine) cannot be taken every day as a standard of the putrefaction process, and still less of intestinal auto-intoxication, whose nature is still not well understood, although much has been written and studied with regard to it. Also, I do not consider the results obtained through the study of the bacteria flora of the faeces, unless made with an efficient purgation, to be of great value for determining the intensity of the putrefaction process in the small intestine. Still less may the many indefinite symptoms of so-called "auto-intoxication" be used as a measure of intestinal putrefaction or intoxication. Many of these symptoms are not present in persons who show great intestinal fermentation and putrefaction, and very often these symptoms appear in persons who do not show abnormalities of the digestive canal.

TRANSDUODENAL IRRIGATIONS BY LIVING LACTIC ACID BACTERIAL CULTURES

For bacterial treatment of many intestinal diseases, as for examples, the dyspepsia of fermentation and putrefaction, enteritis, intestinal intoxication and other diseases of intestinal origin, the use of irrigations of living cultures from true lactic acid bacteria in the small intestine through the intestinal tube has been especially successful. For treatment of pernicious anaemia which, according to the fundamental idea of many authors (principally Hunter, Gravit, Seyderhelm, Maravitz, Strassburger, Van der Reis, Ywam Wolgreen, Von Noorden, Adam, Ashford, Gutierrez-Ygaravide, Rosell and others), has its origin in some cases in intestinal intoxication and in abnormal flora, especially in the ascension of bacteria from the colon and the faecal flora to the higher parts of the small intestine, the use of irrigations of lactic acid bacteria, especially of those cultivated from the highest parts of the small intestine, has proved itself as a valuable therapeutic agent.

Since the publication of one case of pernicious anaemia of intestinal origin,¹⁰ I have had occasion to study a great number of cases of this kind in tropical diarrhoea and sprue. I

have had very favourable results from the use of great quantities of yoghurt and kefir and with the Van der Reis¹¹ treatment with irrigations of lactic acid bacteria cultivated from the small intestine with extraordinary results.

It is possible that with irrigations of *Bacillus acidophilus* the same results may be obtained, but owing to the fact that it seems that *Bacillus acidophilus* is most easily cultivated in the faeces, we do not believe that it is capable of remaining as long a time as the bacteria of yoghurt in the small intestine or higher parts of the colon where the therapeutic bacteria are most required.

The lactic acid bacteria which normally live in the higher parts of the intestine constitute possibly the principal defence against the colonic and faecal bacteria, as the experiments of Van der Reis, which I have been able to confirm, have shown. These normal strong intestinal lactic acid bacteria are not easily cultivated in the faeces. As these lactic acid bacteria are normal inhabitants of the small intestine and higher parts of the colon they are now considered very important for therapeutic application.

I shall outline the characteristics of these bacteria, as I found them during my study of them at the Medical Clinic of the University of Greifswald with Professor Van der Reis, and at the Prussian Institute of Milk Bacteriology, Kiel, under the direction of Professor Henneberg, and recently at the laboratory of the School of Agriculture at Oka.

These bacteria, obtained with the bacteriological intestinal tube of Ganther, Van der Reis, and cultivated from the jejunum and ileum in the highest parts of the colon, have the following characteristics: short, small rods which change somewhat in form or as one coccus (*Diplococcus entericus*), both Gram-positive, non-mobile, non-spore-bearing, without volutine, forming sometimes short chains.

In the usual culture media they grow with difficulty. The best media for these bacteria are beer-wort with pH 6.2, beer-wort agar, with or without peptone, in yeast-water, and with decoction of *Thuja occidentalis* (pH 6.2) and *Rhus Educeus* (pH 5.2). They grow, as well, in milk whey and lactose culture media acidified with 0.3 per cent of lactic acid.

They grow under aerobic and anaerobic condi-

tions, but more easily under the latter. The colony in beer-wort agar becomes apparent to the naked eye after from two to four days. Its characteristic is its minute size. It resembles little points which have a tendency to cluster; its colour is yellow-grey; its edges are even. In anaerobic cultures the colour of the colony is china-white; the optimum temperature is from 40° to 45° C., but it can also grow favourably at 37° C. It also produces in sugar culture media a great quantity of lactic acid and a small quantity of acetic acid, coagulated and strongly acidified milk and gives it a peculiar, often aromatic, smell, and a fresh acid taste. Dextrose, lactose, maltose and especially xylose and arabinose are acidified, but not cane-sugar. Most acid is produced at a temperature of from 37° to 40°, and very little below 30°. These lactic acid bacteria of the small intestine resist hydrochloric acid even to a concentration of 0.3 per cent.

The *enterococcus acidi lactici* was described by Escherich under the name of *S. ovalis* and by Tadel under the name of *diplococcus intestinalis*. It is probably the same streptococcus which Andrews has cultivated in the faeces under the name of *S. fecalis* and Jensen as *S. faecium*. In old cultures, and by remaining some time in the faeces, it loses its capacity of retaining the Gram stain. It may change greatly in size and aspect or in its capacity to form chains and groups. In glucose agar it forms round grey-white colonies. It grows well in Drigalsky and Endo media, differing from all other streptococci forming red opaque colonies on non-liquefied gelatine; it does not produce haemolysis.

In beef extract, after some days, the sediment takes a mucous character. In litmus milk it reduces to white coagulates, and reddens. The great number of strains of this kind of coccus ferment glucose, galactose, laevulose, maltose, lactose, saccharose, dextrin, glycogen, mannite, salicin, raffinose, esculin, and other kinds such as sorbite, arabinose, and inosite. Cultivated in xylose agar it changes its characteristics.

With the elective media, in order to separate it from the haemolytic streptococcus, bile may be employed to advantage, but one of the best points by which to differentiate it is its great thermo-resistance, described by Hudson and MacClog. This streptococcus can resist a temperature of 60°C. for an hour, with pH 7.5.

Most research workers consider this lactic acid intestinal enterococcus to belong to the *S. lacticus* cultivated in sour milk, yoghurt streptococcus thermophilicus. It has the capacity of living permanently in the intestine.

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An Address

ON

SICKNESS INSURANCE*

BY JOHN W. S. McCULLOUGH, M.D., D.P.H.,

Toronto

THE medical profession and the public of eastern Toronto are to be congratulated upon the establishment of this fine hospital serving a large and growing population of the city heretofore unjustly deprived of the necessary facilities for the care of the sick. The growth of institutions of the kind coincides with the steady advance in the cost of sickness in this country, the total of which by careful estimation reaches the enormous sum of 311 millions annually. There are upwards of 60,000 beds in hospitals of all kinds in Canada, the upkeep of which reaches a yearly total of 60 millions. Every increase in hospital beds means an increase in the total voluntary contribution made by physicians to the care of the sick, in the absence of which voluntary contribution hospitals could not exist. It is often pointed out, particularly when the medical profession approaches the government for legislation designed to protect the public against quacks, that that profession enjoys a large degree of protection, that it occupies a preferred position, that the State contributes largely to the cost of the doctor's education, and the opportunity is taken to point out that in return for these alleged privileges the voluntary service of the physician is but

acknowledgment of his debt to the State. It may properly be pointed out in answer to this argument that the earliest of medical legislation—that of Edward I, and later that of Henry VIII in England—as well as subsequent medical enactments down through the centuries, were designed not for the protection of the medical profession but rather for the benefit of the public. The public has the unfounded idea that the service of physicians in the outdoor departments and ordinary wards of hospitals is paid for, and it is a matter of surprise for many persons to learn that all this service is voluntary and unpaid.

In spite of the generous contribution made by the medical profession towards the care of the sick, greater by far than that made by any other body of citizens, and in view of the fact that the public is not even yet receiving the medical and surgical care which the present state of civilization justifies, the question naturally has arisen in this and other countries—How may the medical service to the public be improved?

SICKNESS INSURANCE

A solution of this problem has been attempted in a number of European countries. Voluntary insurance institutions, introduced into Denmark thirty-seven years ago, have been copied by Belgium, France, Finland, Italy, the

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Netherlands, and other countries. In Denmark the system is: carried on by mutual benefit societies and other relief institutions, and in 1925 nearly 1½ million persons, or 57 per cent of the population in that country, were members of sickness associations, and medical attendance including hospital and maternity benefits were provided at a cost of over 4 millions. The International Labour Office of the League of Nations, in its report for 1925 pointed out that the voluntary insurance movement has been found insufficient, and that general and effective protection can only be gained by making insurance compulsory.

The trend of public opinion on the subject may further be observed in the enactment in most countries of Workmen's Compensation Acts for the protection of workers in industrial concerns, the funds being provided by industry and administered by the State, in the establishment of old age pensions, as well as the provision in certain of the provinces of Canada of medical, surgical and dental care in the more remote sections, and in the encroachments on medical practice by health departments. At the present session of the Dominion Parliament, a committee has been taking evidence on the subject of sickness and unemployment insurance. A preliminary report has been made indicating that the subject has found favour with the members of the Committee. This Committee recommended:

(a) That with regard to sickness insurance the Department of Pensions and National Health be requested to initiate a comprehensive survey of the field of public health, with special reference to a national health program. In this, it is believed that it would be possible to secure the co-operation of the provincial and municipal health departments, as well as the organized medical profession.

(b) That in the forthcoming census, provision should be made for the securing of the fullest possible data regarding the extent of unemployment and sickness, and that this should be compiled and published at as early a date as possible.

(c) That the federal government be requested to bring the subject matter of this reference before the next federal-provincial conference; and your committee suggests, when the agenda for such a conference is being arranged, that the provincial governments be invited to send representatives of the employer and employee to discuss the subject matter of this report.

NATIONAL HEALTH INSURANCE

In Great Britain in 1913, compulsory health insurance came into operation, and has continued for the last sixteen years. Under the Insurance Act all manual workers and practically all other workers, whose wages did not

reach the then existing tax limit of £160 (now £250) were obliged to insure. The enactment of this legislation came about because it was discovered that people in very considerable sections of the country never received (or at any rate would never pay for) their medical attendance, unless under some contract or lodge practice, just as with us there are thousands of people who, while paying the grocer and other tradespeople, never intend to pay the doctor.

The medical profession of Great Britain, particularly among the members of the British Medical Association, gave strong opposition to the measure and succeeded in having the original Act modified so as to afford free choice of doctor and patient, the administration of medical benefits by local committees rather than by fraternal societies, representation of doctors on local committees, etc.

Under the National Insurance Act the employers of men and the employed make a weekly payment of 5d. each; for women employed the payment is 4d. the employer paying 5d.; these together form seven-ninths of the contributions, the remaining two-ninths being voted by Parliament.

Sickness Insurance Benefits.—The four ordinary benefits under the Act are:— (1) Medical benefit; (2) Cash benefits; (a) for sickness, (b) for disablement, (c) for maternity.

After a probationary period the normal sickness benefit for a man is 15/-, for a woman 12/- a week for 26 weeks, and both alike are subsequently entitled to disablement benefit of 7/6 a week, for so long as disablement continues up to the age of 70. The maternity benefit is 40/- for the wife of an insured man or double this amount if she also is an employed person under the terms of the Act.

Medical benefit entitles to medical attendance and treatment, including such medical and surgical appliances as may be prescribed by the regulations. It did not at first include specialist or dental treatment, unless the Friendly Society to which the person belonged gave additional benefits. There has been some modification in this respect in recent years. It includes ordinary attendance in tuberculosis, but does not include attendance in confinement for insured women, the maternity benefit in cash taking the place of this.

Administration.—The general administration of the Insurance Act is in the hands of the Ministry of Health whose ministerial head is a layman, while local administration is in the hands of insurance committees upon which the profession has representation, there being a local committee for each county and county borough, or 200 in all for England and Wales. The insurance committees administer the medical benefits, *i.e.*, they are responsible for the medical attendance of all insured persons, while sickness and maternity benefits are administered by the Friendly Societies and by branches of big industrial insurance concerns, that is, they distribute the appropriate sums of money to the insured persons who are sick, to the insured women and the wives of insured men when they are confined.

Every doctor on the British register has a statutory right to be on the panel for the insurance area or areas where he practises, and he can only be removed from that list at his own wish, or after enquiry shows that he is unfit for his position. In England, Wales, and Scotland there are upwards of 33,500 doctors on the register, of whom about 26,000 are in general practice. Of these about 14,000 are actually on the panel, that is, are eligible for insurance practice.

About one-third of the population, or roughly 14 millions of people, are insured and entitled to medical benefit, so that the average number for each doctor is about 1,000. The average attendances of a doctor are 3.8 per insured person, and usually this means one visit to the person, the others being office calls for consultation or a certificate. There is a capitation fee of 9/- per insured person and if his visit is beyond two miles from his office the doctor is paid mileage out of a separate fund. The average fee for attendance is 2/6.

In 1925, the total cost of medical benefit was \$40,242,258, of which \$31,158,131 went to the doctors, and \$9,084,131 for medicines and appliances, so it will be observed that the 13,937 doctors received \$31,158,131 or an average of about \$2,235. In addition the doctor is free to do private practice which, especially in the larger towns, is greater than insurance practice.

Competent observers among the medical profession agree that the system is fairly satisfactory. It has increased the doctor's work

especially at his office. People go earlier for more trifling complaints, which formerly were left untreated or not given sufficiently early attention. It pays the doctor to see cases early; they are more easily cured. The clerical work of certificates and reports, which doctors dislike, is increased.

The doctor's income has undoubtedly increased; he has no bad debts and his pay comes regularly every three months. He has probably lost the income from domestic servants whose bills were formerly paid by the employer. Physicians in industrial and rural areas and particularly in large towns have had an increase in income. The secretary of the British Medical Association says that he doubts if a single doctor on the panel has suffered a decrease in income.

As to the proportion of his time devoted to insurance work the doctor with 1,000 persons on his list would be liable to about 14 items of work a day if he worked 300 days in the year. Of these there would be four visits and 10 surgery attendances. It will be remembered that 1,000 insured persons does not mean 1,000 patients. It really means an average of 3.8 attendances per insured person. While attendances include treatment of fractures, dislocations, minor operations and miscarriages, office attendance frequently means the issue of a certificate. Thus it appears that the doctor has considerable time for private practice.

As to the question of the effect of the system on the morale of the profession, opinions differ, but it cannot be doubted that the security of income, of tenure of position and the large opportunity for private practice should serve to keep up the doctor's status. The system has compelled doctors to work together better; there is less tendency to capture the patients of a neighbouring physician; and while the person may change his doctor he can only do so after notice. The effect on medical research has been the state endowment for this purpose which is under control of the Privy Council.

The effect on the public health is scarcely apparent as yet, but the fact that one-third of the population has a steady medical attendance, that cases are likely to be seen early and by early treatment prevented from reaching more dangerous conditions, is bound sooner or later to reflect itself in a lower incidence of sickness

and lessened death-rate. Eventually there will be a complete clinical record for a large mass of the people, which will be of no small advantage.

Despite certain objections of too much red tape, clerical work, and too little participation by doctors in administration, the profession in Great Britain would scarcely vote to go back to the old conditions. Successive modifications of the Act have made it more workable; certain specialist services have been made available and others will come in the course of time. Altogether the system apparently is working to the advantage of both doctor and patient and has been of great benefit to the Mother Country.

HEALTH INSURANCE FOR CANADA

Is a system of sickness insurance or of state medicine practicable in Canada? Before taking up this subject let us enquire if the medical and public health services of the country are satisfactory.

Medical Service.—There are wide areas of Canada where the distance from medical aid prevents the existence of anything like an adequate service. This is serious, particularly in respect to the care of the mother in childbirth, and no doubt contributes largely to the high maternal mortality rate.

To persons of moderate means the cost of medical and nursing attention prevents early consultation in what might be called minor illnesses, some of which, for want of a doctor, develop into serious and incurable conditions. Where free hospital services exist these are often abused by people otherwise able to pay, and there are many people who employ and never pay or intend to pay, the doctor. There seems no doubt that the present position of medical service is satisfactory neither to the profession nor to the public.

The public health service is in a much worse situation. There are only about a score of the municipalities of Canada with a satisfactory public health service. Of the 930 municipalities of Ontario, but twelve possess competent health departments. The cost of sickness in Ontario reaches at least 100 millions annually, yet there are less than 2 millions expended by governments and municipalities in preventive health work. The contrast between the amount of money spent on education and that spent to

maintain the health of the population of the province is startling.

Ontario, spending less than 2 millions to control disease, spends over 48 millions annually on education. Which is the more important, a fine education with indifferent health, or good health with a moderate education?

It must be admitted that the medical service of the country both on the curative and preventive side can scarcely be called satisfactory. What is the practical solution? This solution might be reached by: (1) The provision of medical and surgical and dental service by the State to persons earning, as in Great Britain, less than a certain income. (2) Development of the public health service, so as to make it as effective as possible in both urban and rural areas.

State Medical Service.—Taking up the first item; it may be repeated that there is already a sort of crude state medicine in Canada. Large corporations have a medical service; the employees of the large industries in New Ontario have for years had a medical service, for which they pay so much per month; accidents in industry are taken care of by the Workmen's Compensation Board; there is treatment of Veteran Soldiers by the Department of Pensions and National Health; a State medical service is under construction in some of the western provinces. A State medical service would provide the poor with continuous and steady medical attention, relieve physicians of bad debts, hospitals from abuse of the out-patient departments, and establish in the course of time valuable clinical records. The possibility of the establishment of such a service is indicated by the trend of events in parts of Canada, and in view of this doctors should stand on guard to see that they, upon whom the success of any scheme of the kind most depends, should have a fair share in the administration, and a reasonable return for their services. The difficulties in such a wide area as Canada will be greater than in countries with a small area and dense population, but these difficulties may be overcome.

The public health problem can be solved by: (1) a consolidation of local health units; (2) expenditure of larger sums of money; (3) co-operation of the medical profession; (4) education of the people in health.

The 930 health units of Ontario should be consolidated into about 60, each with a whole-time competent medical officer of health and staff, the cost of which, depending on the areas involved, would run from \$10,000 to \$15,000, for a rural area to \$25,000 to \$50,000, for the smaller cities not at present served by a whole-time organization.

The requisite funds should be the joint contribution of Dominion, provincial and municipal governments. If it is good business for the Dominion to spend large sums in the promotion of immigration, it is surely equally good business to protect the health and lives of the native population. Greater expenditure in prevention by provincial governments would eventually relieve the provinces to some extent at least of the ever mounting bills for hospital and institutional care of all kinds, of the expense of old age pensions, of mothers' allowances, etc., much of the latter two being the result of the poverty whose greatest cause is sickness.

Health departments must in the future gain the co-operation of and employ more and more the services of the general practitioner. This co-operation can only be obtained by utilizing and paying for the services of the ordinary physician in general public health work, such as vaccination, inoculation, school medical inspection, baby clinic work, etc., and by removing the competition in practice of the part-time medical officer of health. Finally, the public must be educated in the value to them of health work, and the best place to provide this education is in the schools. A great

opportunity for the spread of health education in the schools is being neglected at present, because in all but a few of the municipalities there is no one at hand to carry on this work. Similarly, a great opportunity is being missed of discovering tuberculosis, heart disease and other affections at an age when most can be done to limit the ravages of affections, which are among those causing the highest rates of mortality.

CONCLUSIONS

In view of the foregoing considerations it seems that a State system of health or sickness insurance including an improved public health service is desirable. Such a service would afford:

1. A sense of security in time of sickness on the part of the entire insured population.
2. Medical attention to those not now in a position to obtain such attention.
3. Early recognition and treatment of minor ailments, and the possible prevention of incurable conditions.
4. A clinical record of a large portion of the population.
5. A feeling of greater financial security among doctors who serve the industrial population.
6. A certain assured income.
7. Participation in and remuneration for certain public health services.
8. The spread of health education among the people.
9. Early discovery of children's defects through medical inspection of schools.

METHOD OF ESTIMATING CARDIAC EFFICIENCY.—The aim of a cardiac test was to secure some objective method of estimation which could be used to determine the efficiency of a heart on more than one occasion and by which a second observer could estimate the changes noted by the first. Vague terms and varied opinions made it very difficult to trace the history of a heart through other people's notes. The six factors taken were: reclining pulse-rate, standing pulse-rate, difference between reclining and standing pulse-rate, pulse-rate after standard exercise (touching the toes 20 times), time in which pulse-rate returned to normal, and difference between standing and reclining blood pressures. The fact that the nurse could take the pulse-rate obviated errors due to excitement at the doctor's visit.

A system of marks varying from 3 to -1 was allotted to each test, so that a maximum of 18 could be obtained. Eight marks constituted a pass, 7 was doubtful, and below 6 some cardiac damage was indicated. The test was subject to the fallacies of all numerical tests, but had been based on a large number of cases, and it did give an index by which progress could be gauged from time to time. It was essential that the elements of a test should be obtainable in any bedroom, and elaborate clinical methods were therefore inadmissible. The test was especially useful in those cases where there was a rapid heart but nothing else. The heart that gave a poor response to the test often developed symptoms of damage later on. The scheme was put forward with all reserve and with no claim at all to finality.—*Lancet*, 1929.

A NEW ANÆSTHETIC GAS:: CYCLOPROPANE*

A PRELIMINARY REPORT

By G. H. W. LUCAS AND V. E. HENDERSON,

*Department of Pharmacology, University of Toronto**Toronto*

AS is well known, the anæsthetic gas propylene manufactured and tanked by Squibb showed toxic properties which were not evident in the original gas produced in this laboratory. Tests made here with Squibb gas were in accord with observations made elsewhere. The cause of the toxicity was unknown, and while looking up its possible sources one of us (G. H. W. L.) suggested that possibly some cyclopropane might have been produced. We consequently determined to examine this gas.

According to Willstätter, cyclopropane can be made by the reduction of trimethylene bromide by zinc dust in the presence of alcohol and traces of water. The gas produced by this interaction did not consist of pure cyclopropane, but contained a small percentage of propylene, which was absorbed with potassium permanganate. The residue contained from 93 per cent to 85 per cent cyclopropane and 7 to 15 per cent of an unknown gas. As the anæsthetic property might be due to this unknown gas, all the cyclopropane was removed from a large sample by absorption with sulphuric acid, and one or two experiments were performed with the residue. This residual gas was not anæsthetic at all in concentrations up to 40 per cent. It was exploded with oxygen and probably consists of a saturated hydrocarbon and hydrogen. Consequently, the whole gas, less the propylene, has been used throughout our experiments and the percentage of cyclopropane obtained by analysis based on the amount absorbed by sulphuric acid.

Our earliest experiments showed that cyclopropane was a remarkably potent anæsthetic with but slight toxic properties, as may be illustrated by the following protocols and illustrations.

EXPERIMENT 1

Dec. 3, 1928. A cat of 2 kg., anæsthetized with 15.6 per cent cyclopropane. 2 p.m. Connected to re-breathing respiration recorder (CO₂ absorbed) and blood pressure recorder from carotid. Blood pressure 135 mm. Hg. respiration rate 32; vol. 60 c.c., min. vol. 1920 c.c. 2.05 Blood pressure 127 mm. Hg. respiration rate 33; vol. 60 c.c., min. vol. 1980 c.c. 2.57. Blood pressure 127 mm. Hg. respiration rate 30; vol. 64 c.c., min. vol. 1920 c.c. Oxygen had been allowed to increase in the last 5 minutes. Gas analyzed gave 9.2 per cent cyclopropane anæsthesia, light surgical. 3.22. Cyclopropane added. New analyses showed 16.6 per cent cyclopropane. 3.27. Blood pressure 95 mm. Hg. respiration rate 27; vol. 42, min. vol. 1134 c.c. 3.35. Blood pressure 72 mm. Hg. respiration rate 33; vol. 32, min. vol. 1056 c.c. Very deep surgical anæsthesia since 3.25 p.m. The oxygen percentage was allowed to fall and cyclopropane was being added. 3.36. Gas analysis showed 22 per cent cyclopropane. 3.52. Blood pressure 45 mm. Hg. respiration rate 27; vol. 32, min. vol. 864 c.c. With a percentage of 27 the blood pressure continued to fall and respiration became more shallow. Anæsthesia was maintained for over one hour with no appreciable fall in the blood pressure and good respiratory volume.

EXPERIMENT 2

Jan. 3, 1929. A cat of 1.5 kg., anæsthetized with 15 per cent cyclopropane in oxygen. 10.52 a.m. Connected to respiration and blood pressure recorders. Blood pressure 125 mm. Hg. respiration rate 24; vol. 60 c.c., min. vol. 1440 c.c. 11.24. Analysis of cyclopropane 12 per cent, surgical anæsthesia. Blood pressure 115, respiration rate 15; vol. 60 c.c., min. vol. 900 c.c. 11.37. Analysis of cyclopropane 19.5 per cent. Very deep surgical anæsthesia. Blood pressure 140, respiration rate 18; vol. 38 c.c., min. vol. 684 c.c. 11.44. Cyclopropane had been added to give 35 per cent. Respiration very shallow. Blood pressure still 135. The cat was allowed to breathe air for 100 seconds and respiration reconnected. 11.59. Cyclopropane now 27.5 per cent. Blood pressure 135, respiration rate 33; vol. 16 c.c., min. vol. 528 c.c. Respiration gradually failing. 12.08. Cyclopropane now 32 per cent. Blood pressure 100, respiration rate 54; vol. 6 c.c., min. vol. 324 c.c. Blood pressure then fell rapidly. Heart death 4 mins. after the cessation of respiration.

In this experiment respiratory failure preceded the fall in blood pressure, but it will be seen that there is a wide range between the concentration needed for surgical anæsthesia (12 per cent) and the fatal concentration, (27 to 30 per cent).

These experiments, which are typical, show that in cats surgical anæsthesia may be maintained with 10 to 11 per cent of cyclopropane. The percentage required for rabbits appears to

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be slightly higher, namely 14 to 15 per cent. Toxic features do not appear rapidly, save with concentrations of 18 to 20 per cent in cats, though a fall of blood-pressure of not serious extent may occur with 16 per cent and upwards. Toxic effects may be evident, either in a fall of blood pressure or more usually in respiration becoming shallower and slower.

Recovery from doses toxic to respiration is very rapid, 2 to 3 minutes; if the toxicity has shown itself in a fall of blood pressure the recovery is not so rapid. Recovery of an animal when not operated upon is well shown by the following protocol.

EXPERIMENT 3

Feb. 1, 1929. A cat of 1.5 kg. At 1.40 p.m. the animal was placed in an anesthetizing tank and at 1.55 p.m. a gas mixture of 15.4 per cent cyclopropane in air and oxygen was admitted. The cat slowly sank down, with no stage of excitement, and was apparently deeply anesthetized in four or five minutes. It did not respond to poking. The respiration rate was 10 to 12 per min. and deep, slightly jerky, with prolonged inspiration. 4.05 p.m. The state was still the same. Analysis showed 13.3 cyclopropane and 30 per cent oxygen. When removed the cat winked and moved its tongue in one minute, sat up, and walked about in three minutes. In five minutes purred when petted. It was quite normal a week later.

In this experiment, as in others to be quoted subsequently, the animals were placed in a large bell jar standing in a trough containing mercury in a plate which served to close the lower end. In the bell jar also was a rubber balloon containing air. The air in the jar was enriched by passing in oxygen. The jar also contained a large surface of moveable soda lime CO_2 absorber. When the air had been sufficiently enriched, the balloon connected to the outside was deflated and cyclopropane run into the jar to give the required concentration.

The above experiment also showed that there appeared to be no subsequent after-effects. This was shown in other animals also. Further, both rabbits and cats have been anesthetized at least three times without showing bad after-effects, as may be shown by the following protocols.

EXPERIMENT 4

Jan. 22, 1929. A rabbit of 2.5 kg., very fat. Light anesthesia was instituted for two hours with a final percentage of 10.3 per cent cyclopropane. The animal was reanesthetized the next day, with approximately 27 per cent cyclopropane for 140 minutes, finally a gas analysis of 18 per cent cyclopropane, and 31 per cent oxygen. Fairly deep anesthesia was obtained though probably not to the surgical degree. Recovery was rapid, i.e., in 2 minutes. The rabbit was reanesthetized on

Jan. 25, 1929, for 2 hours. The soda-lime contained did not function properly and moisture accumulated; there was a good deal of salivation; nose bedded in the bladder. CO_2 at end of experiment was 7.7 per cent; cyclopropane 18.3 per cent; oxygen 26 per cent. Recovery was slow, but the rabbit was apparently all right the next day. When killed, the kidneys, liver and heart were found to be normal.

EXPERIMENT 5

May 6, 1929. Five kittens, 6 to 7 weeks old, of a total weight of 1.8 kg., were anesthetized in the chamber with approximately 11.5 per cent cyclopropane in oxygen and air. Three kittens became rapidly anesthetized; one moved its head and body throughout, one was intermediate. When taken out after a 75 min. anesthesia two showed nausea, one deep and one light. Two that went under fastest recovered most slowly (10 minutes were required to walk normally). May 7, 1929. All were reanesthetized (Kodak gas) with approximately 14 per cent gas of 42 per cent oxygen for one hour. Resistance to anesthesia the same, but all deeper than before: the most resistant were fairly under. Recovery in all cases as prompt or more so than on the previous day. May 8, 1929. All were reanesthetized (Kodak gas) with approximately 12 per cent gas. All became completely anesthetized and anesthesia lasted for 90 minutes. Finally gas analysis gave 10.3 per cent cyclopropane, 35 per cent oxygen. Recovery was rapid and in the same order. The white kitten always showed nausea; two others once each. May 9, 1929. The intermediate and the one least resistant were killed; no pathological change was found. The others died in 4 to 5 days, but death seemed to be due to inanition (they had at no time eaten well). The livers and other organs were normal histologically.

Several experiments have been performed in which blood analyses were made in order to follow changes in metabolism. Our results in the experiments carried out thus far can be summarized as follows.

June 3, 1929. Cat, 1050 gm., 1.25 p.m., Ph. 7.42; CO_2 36.9; blood sugar 0.189. 2.35 p.m., Ph. 7.40; CO_2 43.5; blood sugar 0.197. 3.10 p.m., Ph. 7.35; CO_2 44.5; blood sugar 0.187. June 4, 1929. Rabbit, 3.2 kg., 10.28 a.m., Ph. 7.45; CO_2 53.8; blood sugar 0.152. 11.43 a.m., Ph. 7.55; CO_2 65.3; blood sugar 0.160. June 7, 1929. Cat, 2.5 kg., 1.40 p.m., Ph. 7.55; CO_2 38.6; blood sugar 0.173. (Somewhat toxic, sample; low blood pressure). 2.40 p.m., Ph. 7.35; CO_2 46.3; blood sugar 0.236. 3.17 p.m., Ph. 7.35; CO_2 47.2; blood sugar 0.219.

These figures show a slight rise in Ph and CO_2 -combining power, with little change in the blood sugar, save in the last case where there was but slight change after the second sample. Owing to a technical accident the cat struggled for a period of two minutes soon after taking the first sample, and this probably accounts for the change in the blood sugar. The rise in Ph and CO_2 -combining power looks like a blowing off of CO_2 and in all these cases the respiratory volume remained high and CO_2 was completely reabsorbed. The resistance of the recorder leads, as may be seen, to a somewhat forced breathing and probably explains this change. The figures for Ph and CO_2 -combining power

remain more normal than with any other anæsthetic. The gas inhaled in all these cases was high in oxygen (50 to 70 per cent). The same apparatus was used in these experiments as in our previous ones with propylene in which CO_2 -combining power and Ph fell.

The solubilities in oil and water of cyclopropane were determined by shaking a weighed quantity of oil or of water with a measured quantity of cyclopropane in a constant temperature bath at 35°C ., until the gas volume became constant at constant pressure. One cubic centimetre of olive oil (sp. gr. 0.920) dissolved 103.5 c.c. of cyclopropane, while 1 c.c. of water dissolved approximately 0.160 c.c., giving an oil water ratio of 64.4 at a temperature of 35°C . This compares favourably with nitrous oxide (2.8); ethylene (13.2); acetylene (2.1); ether (2.5).

In summarizing we can state that the best cyclopropane we have had appeared to be an anæsthetic with a high potency, some 10 to 12 per cent producing deep surgical anæsthesia in cats. In higher percentages there is a decrease in respiratory depth and frequently in rate, and in some cases a fall in blood pressure. Respiration fails before the heart and circulation. Indeed, the heart seems to be but little affected, as we have tested its activity by injecting adrenalin after respiration had become very shallow and obtained a prolonged rise in blood pressure of normal height, and asphyxia also causes a typical rise in pressure. In no case did the heart not show a high degree of efficiency. The fall in blood pressure appears to be of vasomotor origin. Temporarily in some experiments irregularities have appeared on the blood pressure tracing which appeared like missed beats when a high concentration of cyclopropane was used. These, however, disappeared in all cases and the heart became normal. They also failed to appear later in the same experiment when the concentration was again raised. It is possible they were artefacts, but subsequent study will be undertaken in regard to this point. Recovery appears to be prompt and with little after-effects. Metabolic effects appear to be slight or absent.

The first cyclopropane with which we experimented was made from a sample of trimethylene bromide obtained from Schuchart & Co. This sample was water clear, and 90 per cent

distilled between $161\text{--}3^\circ \text{C}$. This small supply was rapidly exhausted, and we obtained a further supply of the bromide from the Eastman Kodak Co. This sample was yellowish in colour, began to distill at 110°C ., and distillation was not complete at 170° . Only some 60 per cent distilled between $161\text{--}165^\circ \text{C}$., and this only was used. Unfortunately, this gas seemed to have some toxic qualities absent from the first. Blood pressure seemed to fall more after deep surgical anæsthesia was reached and salivation appeared to be more marked. We think that prolonged standing over a permanganate solution decreased this toxicity.

We have recently prepared cyclopropane from a third source of trimethylene bromide which appeared to be of a good quality though not so good as the first. Again, the freshly prepared gas required higher percentages to produce anæsthesia; blood pressure was at no time high and tended to fall to half its normal value at deep surgical levels; and also a good deal of tracheal mucus was produced. The same gas, however, after standing over permanganate solution for twenty-four hours was distinctly more potent and there was no mucus produced, and blood pressure was very resistant; even 30 per cent which made respiration very slow and shallow left the blood pressure almost unaffected. However, with this later gas there appeared an increase in flexor tonus in the hind limbs; the limbs resisted extension and after severe stimulation of the femoral nerve showed a contraction, even when the effect of stimulation on blood pressure was almost completely absent, and on respiration very slight, and the corneal reflex had long been absent.

In view of these technical difficulties, which are not as yet completely settled, and as some of the experiments reported above were made with samples of gas which were by no means of the best quality, we feel that this is to be regarded as a preliminary report only, and the conclusions we have drawn in regard to solubility and as to the anæsthetic qualities of the gas must be regarded as tentative only.

Cyclopropane has a sweetish smell, like a mixture of chloroform and ethylene. It is heavier than air and is explosive in 5 per cent and upwards in oxygen. With air it does not explode in mixtures above 10 per cent.

THE ACUTE GASTRO-INTESTINAL DISORDERS OF INFANCY*

By S. G. Ross, M.D.,

Montreal

I HAVE chosen for the subject of my paper a common ailment: not a new or rare condition, but one which is with us from day to day and especially in the hot days of summer. It would seem advisable at times to review well-worn subjects in order to evaluate new facts or theories. In a limited way I have attempted to do this and have taken as a basis for my remarks the study of a group of 59 consecutive cases of acute gastro-intestinal disorders admitted to the Pædiatric Department of the Royal Victoria Hospital during a period of two years. Any conclusions, then, drawn from the series, must be modified in a general outlook, as they naturally deal only with the serious cases which required hospitalization.

THE AGE FACTOR

The digestive system of a child, and especially that of infants, is peculiarly liable to disturbances in function. Any insult to the digestive tract at this age may result in an acute gastro-intestinal disorder. The reasons for this are not entirely clear. In the series of cases studied, we note that 51 out of 59 occurred in the first year of life and only 8 in the second year. After two years of age, it is rarely that we see cases of acute digestive disorder severe enough to require hospitalization.

ETIOLOGY

The etiology of these disorders has long been and still is a moot point. However, certain facts stand out.

Malnutrition is undoubtedly a predisposing cause. The mal-nourished infant has a diminished digestive tolerance often resulting from a previous digestive disorder. In our cases only 9 were of normal weight; the remainder were definitely or markedly underweight. We look upon malnutrition as the most important predisposing cause.

Breast-feeding.—The failure of a mother to nurse her child is the other important predisposing cause. The type of feeding used in

these cases is illuminating. Fifty-six were artificially fed, two only were breast-fed, while one was on "mixed feeding." These figures alone illustrate the supreme importance of breast-feeding in preventing gastro-intestinal disorders. In many of these infants there was a history of failure to gain properly after weaning, with resulting malnutrition.

Direct Causes.—These may be classified under three headings in the order of their importance: (1) Summer heat. (2) Infection. (3) Improper feeding. It is a well-known fact that the high peak of incidence of the disorders is usually in the middle and end of the summer months. In our cases, 12 occurred in July, 27 in August and 11 in September, that is, 50 out of the total 59 cases. I shall discuss the probable reason for this later.

Infection.—The influence of infection of any type in causing gastro-intestinal disorders is recognized and has been possibly over-emphasized of late. These infections may be either enteral or parenteral. I have made an attempt to estimate the part played by infection in this series. In the 59 cases, no primary infection was found in 35 cases, whereas in 24 a definite infection was present as a probable cause of the disorder. Otitis media was the commonest infection, and this finding, I think, is borne out by all observers. I have carefully eliminated in these cases all infections arising during the course of the illness, because it is well known that during acute gastro-intestinal disorders, especially in malnourished infants, infections of all kinds may intervene. These, however, should be considered as secondary to the disease rather than the causal agent, although they do, in turn, have an adverse effect upon the course of the disorder.

During the past four or five years Marriott and other workers have emphasized the rôle of mastoid infection as a cause of many of the acute digestive disorders of infancy. They claim that with infection of the middle ear, the mastoid is often involved. In many cases there is no external evidence of mastoid infection. On opening the mastoid antrum, either on the operating

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From the Department of Pediatrics, the Royal Victoria Hospital, Montreal.

table or at post-mortem, pus has been found. They advise antrotomy of the mastoid bone under local anæsthetic in cases where mastoid infection is present or suspected. By this means, the infection causing the secondary gastro-intestinal disorder may be overcome and the patient recover. Our experience on this subject has been limited. The post-mortem table will often reveal infection of the middle ear and mastoid in marasmic infants. We should, however, bear in mind that this may be a terminal infection like bronchopneumonia. On the other hand, when an acute otitis media appears to be the causal factor in an acute digestive disorder, the mastoid antrum is sometimes involved. If the patient does not respond to treatment after paracentesis of the drums, antrotomy would be permissible under local anæsthetic. We have had several recoveries in such cases where the drainage of the mastoid seemed to be the deciding factor. In the majority, however, the course of the disease was uninfluenced by this operation.

Improper Feeding.—Over-feeding, too frequent feedings, feeding a food too rich in one element, e.g., carbohydrate, may all cause acute gastro-intestinal disorders. The feeding of stale milk, containing the irritating products of fermentation and putrefaction, may also upset the digestion. With the comparative purity of our present-day milk supply, this factor is not as important as it was formerly.

One might summarize as follows: The vast majority of these cases occur in the summer months. In artificially-fed infants who are under-nourished, a continuous high atmospheric temperature and humidity lowers the digestive capacity or tolerance of the infant. Under such circumstances, any improper feeding results in an acute digestive disorder.

The opposing view that the ordinary so-called "summer diarrhœa" is infectious is not proved, to say the least. There is undoubtedly a group of these due to intestinal infections, such as bacillary dysentery, possibly certain strains of streptococcus, and occasionally the typhoid group. Unless, however, we are prepared to accept the hypothesis of some unknown virus or organism as a causal agent or to assume that the ordinary bowel saprophytes suddenly become pathogenic and produce toxins, it seems more reasonable to accept the former theory. Some support is given to this by our figures, which show that in only four

cases were pathogenic organisms found in the stools of these infants. In a large series of cases, this has been the experience of other workers. The parenteral infections, however, do seem to play a very important part in causing these disorders. Their toxins act on the cells of the digestive tract, lessening secretion, causing gastric stagnation and thus disturbing digestion, with resulting vomiting and diarrhœa. Such parenteral infections would obviously be more serious in marasmic infants during the summer months.

CLASSIFICATION

The classification which we have adopted is a simple one based on the clinical picture. These cases are sub-divided into two groups. (a) acute gastro-intestinal indigestion, 48; (b) acute gastro-intestinal intoxication, 11. The second, to my mind, is not a separate disease but merely an advanced stage of the first. However, in it we get a fairly constant set of symptoms which entitle it to separate consideration.

SYMPTOMS

The characteristic onset is a sudden anorexia, usually accompanied by vomiting, almost invariably with diarrhœa. Fever is present in most cases, and colic is often present. If refusal of food persists along with vomiting and diarrhœa, the infant, who is more hydrolabile than the adult, shows signs of dehydration as a result of the loss of fluids. The skin loses its elasticity and, on being pinched up into a fold, does not immediately flatten out. In our cases, diarrhœa was present in all, vomiting in 38, and fever in 42 cases. In the severe cases, the so-called gastro-intestinal intoxication, certain features are added to the picture. The dehydration is severe, the eyes are sunken, the fontanelle depressed, the nose pinched, and the whole skin may have a shrivelled appearance. As a result of this dehydration, the circulation is poor. The blood volume and blood flow are lessened. Cyanosis, especially of the extremities, results; the hands and feet are cold although the temperature may be very high. Anuria is also present, probably as a result of the impaired circulation. The intoxication is indicated by drowsiness, often passing into coma, the patient has a mask-like stare and is barely conscious of his surroundings; he makes few movements. Occasionally convulsions oc-

cur. The third cardinal symptom is acidosis. Although not always present, it occurs frequently. The diagnosis is easily made clinically by the deep, pauseless respirations, (Kussmaul's air-hunger), which is pathognomonic. It is sometimes of the ketone-body type of acidosis but usually not. The pathogenesis of this type of acidosis is not settled but there is evidence that it is due to the failure of the kidney to eliminate normal acids of metabolism, such as phosphoric, and abnormal acids, such as lactic acid. Sometimes it is due to a proportionately greater loss of base from the blood than acid.

DIAGNOSIS

This usually offers no difficulty. It is important, however, to make a general examination in order to decide whether we are dealing with a primary gastro-intestinal indigestion or one secondary to infection. If, for example, an otitis media or furunculosis be present, prompt treatment of these is essential. In all cases of acute digestive disorder in infants, especially with fever, the ears should be examined. The diagnosis of enteral infection is usually easy. Any infant suffering from a bloody diarrhoea, especially when associated with the presence of pus in the stools, is suffering from an infective entero-colitis. In nearly all these cases, the infecting organism is one of the bacillary dysentery group. Amœbic dysentery is practically unknown in this country. Careful bacteriological studies will usually reveal the infecting micro-organism. It must be remembered that occasionally in intussusception the infant passes frequent small stools containing very little but mucus and blood. The differential diagnosis could be made from the history, the presence of the tumour, and the absence of fever in intussusception. Typhoid fever in infants sometimes shows acute gastro-intestinal symptoms. During the epidemic of 1927, an infant of nine months was admitted with a diagnosis of acute gastro-intestinal indigestion. It was suffering from typhoid fever.

PATHOLOGY

There is nothing characteristic in the stomach and bowel in this disease. The only exception is that in the true intestinal infections, such as dysentery or typhoid, the lesions of these diseases will be found.

PROGNOSIS

The prognosis depends upon a number of factors. Breast-fed infants do better than those artificially-fed for three reasons: (1) They are getting a food which is usually easier to digest than any artificial feeding. (2) They have a greater immunity to infection than artificially-fed infants. (3) They are less frequently mal-nourished or marasmic.

The most important factor in prognosis is the nutrition of the child. The marasmic infant is the one which goes to the wall during an acute digestive disorder. The second important factor is the time of year. The majority of deaths occur during the hot summer months. At this period, the infant dies of inanition, usually with terminal infection, because the digestive system cannot tolerate sufficient food to sustain life. The prognosis in the cases secondary to infection is worse than in the non-infectious cases. We had 13 deaths in our series. Of these, 8 were in cases following infection, i.e., a percentage of 33; whereas in the non-infectious cases the percentage mortality was 14. In the severe form of the disease, i.e., the gastro-intestinal intoxication, the mortality is very high, varying between 25 and 75 per cent. In our series, the mortality in acute gastro-intestinal indigestion was 17 per cent, whereas in acute gastro-intestinal intoxication it was 45 per cent. The total mortality was 22 per cent.

PREVENTION

The acute digestive disorders of infancy and the consequent mortality are steadily decreasing. They still, however, account for about one-third of the mortality of the first year of life. The chief reasons for the reduced incidence have, I think, been the improved methods of infant feeding and hygiene, and for this improvement too much cannot be said for the numerous health centres for the poor of the city, where mothers are given instruction in the proper feeding of their infants. The education of the public to the importance of keeping an infant in a good state of nutrition will do more than anything else to further reduce the incidence of this disease. Other factors in prevention are the insistence on a good milk supply and the elimination of feeding poorly-balanced foods such as sweetened condensed milks.

TREATMENT

At the onset of the disease, a thorough purge with a drachm of castor oil is of value. This, however, should not be repeated after the first day. By that time, nature has done its work.

Stop food for a period varying from 6 to 48 hours. This depends upon the severity of the symptoms. A good general rule is to start food when the infant stops vomiting water.

Supply fluids. The fluids lost from the body through vomiting and diarrhoea must be replaced, as many of the symptoms result from dehydration.

Water, plain or sweetened with saccharin, may be given every hour. Persist even if vomiting occurs. In the mild cases, this is sufficient. If, however, dehydration is obvious, it is necessary to supplement this by other methods.

Hypodermoclysis with 5 per cent glucose in normal saline. This supplies salt as well as water and some sugar to combat the ketosis if present. Some clinicians give 10 per cent glucose, but we have found that it is not absorbed so well. It may be given in amounts of 100 to 125 c.c. twice or even three times daily, depending upon the rapidity of the absorption.

For rapid absorption in the severe cases, the intraperitoneal injection of normal saline is efficacious. It may be given in amounts varying from 250 to 300 c.c. at a time. With certain precautions, it is without risk.

In the very severe cases, the intravenous injection of 10 per cent glucose in saline seems to be of definite value in improving the general condition, including the patient's circulation. The technical difficulties of intravenous therapy in infants are one of the objections to its use. Rectal salines are of little or no value on account of the irritability of the bowel, which prevents their retention. At times we have used the nasal drip method of introducing fluid into the stomach where vomiting is persistent.

The results of sufficient fluid administration are usually striking. The patient becomes brighter, the colour and circulation improve, the kidneys begin to function and the toxic symptoms are abated. The acidosis usually disappears, probably as a result of the improvement in the circulation and the restoration of kidney function. In the grave cases, this improvement may be only temporary, and unless the digestive function is restored, the child will finally succumb.

Feeding.—Only the general principles can be outlined here and a few examples of specific feedings given.

1. Start feeding after the toxic symptoms have abated and the vomiting has ceased.

2. Begin with a small amount of food, *e.g.*, half an ounce at a time and increase regularly by this amount unless severe vomiting occurs. Feed every three or four hours. The interval depends upon the individual case.

3. Start with a 5 per cent cereal gruel, such as rice or barley.

4. As the infant's tolerance for fat and carbohydrate is low, the first milk added to the cereal gruel should be skimmed or partly skimmed. The first carbohydrate added should be dextrimaltose or corn syrup, that is, a sugar which is less easily fermentable than cane sugar or milk sugar.

5. The use of a milk acidified with lactic acid, either naturally as buttermilk, or artificially as lactic acid milk or protein milk, has been found to be usually more suitable than the use of sweet milk in these cases.

First day.—Water every hour.

Second day.—Barley gruel every 3 or 4 hours.

Third day.—Skimmed lactic acid milk + barley gruel + 2½ per cent dextrimaltose every 3 or 4 hours.

Later.—2 per cent lactic acid milk + barley gruel + 5 per cent dextrimaltose every 3 or 4 hours.

One point requires emphasis. Too often in the past these infants have been starved through treating the diarrhoea rather than the baby. In curing the diarrhoea, the baby has been starved to death. If the infant is taking its food well and has stopped vomiting, the increase in the feeding must not be stopped because the stools remain somewhat diarrhoeal. To do so is often to court disaster by starvation.

Infection.—Any infection must receive prompt attention. The most striking results are seen in the treatment of otitis media by early incision of the drum membrane. The opening of furuncles or abscesses is important. Unfortunately, many of the infections such as pneumonia, dysentery, and others, do not respond well to treatment, and it is these cases which so frequently die. The serum treatment of dysentery in infants is useless and the mortality in these patients is very high.

Two examples may be cited, illustrating the relationship of parenteral infection to these disorders and the result of treatment.

CASE 1

An infant, 3 weeks old; birth weight 5½ lbs. Breast-fed for 8 days; complemental feedings for the next week. At 16 days severe vomiting and diarrhoea began, which necessitated admission to the hospital. The child was acutely ill; temperature 100°; collapsed, dehydrated, cyanosed, weight was 4 lb. 1 oz. The pharynx and left drum membrane were reddened. It was given intravenous salines and transfusion. On the following day, vomiting persisted. Both ear drums were reddened and left ear bulging. The drums were incised. Pus was obtained from left drum. Tempera-

ON THE POSSIBILITY OF RELIEVING ABDOMINAL PAIN BY SECTION OF THE SYMPATHETIC RAMI COMMUNICANTES*

By F. A. C. SCRINGER, B.A., M.D.,

Montreal

THERE are a good many instances of abdominal pain for which no obvious explanation can be given by reference to any definite lesion. Such patients we have all seen: many of them have been operated upon many times; and at each operation something has been taken away, as a certain famous surgeon once said, "not a normal appendix mind you." They then may be classed as "neurasthenic," if no stronger expression is employed. By such a label we not infrequently deceive ourselves into thinking that an adequate explanation of their complaints has been given.

I do not wish to be understood as suggesting that all of these come within the field for discussion in this paper. Nor shall I be able to define with any exactness by what criteria they may be selected. All I desire to propose is an angle for approach not generally considered, in the hope that this may lead, through more exact knowledge, to methods of relief not usually followed.

My interest was aroused some two and a half years ago when, in the effort to puzzle out a difficult case, my attention was drawn to a publication by von Gaza in *Arch. für Klin. Chir.* 1924. Von Gaza put forward his belief that in some instances these patients may be relieved of their pain by section of the paravertebral nerves or the sympathetic rami communicantes, on the ground that afferent stimuli arising in the distribution of the sympathetic nervous system may, in abnormally irritable states, be recognized as pain referred either to the area from which the nerve has come or to the corresponding cerebrospinal segment. Such a theorem demands an inquiry into our knowledge of the possibilities for perception of pain from areas whose nerve supply is derived from the sympathetic nervous system.

In the opening chapter of his book "Die

* Read before the Surgical Section, New York Academy of Medicine, May 1929.

Leitungsbahnen der Schmerzgefühls und die chirurgische Behandlung der Schmerzzustände," Foerster states that, "pain is to all of us a well known definite psychic experience." As a psychic experience it can be perceived only in response to afferent stimuli depending on the irritability of a sensory end organ, on a sensory path to conduct the effect to the central grey matter. Various factors influence our perception of pain. The character of the stimulus, not only its kind and intensity but its duration, the summation of effect, may play an even greater rôle in the sympathetic than in the cerebrospinal pain system. Also the varying irritability of the sense organ is of the greatest importance. We know that the acuteness of perception of pain varies greatly among individuals within normal limits, and varies in individuals at different times. We know that our perception of pain is most acute if our attention is fixed in expectation of the exciting stimulus, or dulled if our attention is otherwise engaged. I have seen a man run on the bared stumps of a shattered leg, flinging his foot, still held by his boot, to one side with each step, without the perception of pain. One hour after, in quieter surroundings, such activity would have been impossible. I have seen a two year old child sit in its cot quite pleased at the attention while a three inch incision was made in its scalp for the drainage of an abscess, when no anæsthetic, either local or general, had been used. The child had no ability to perceive pain anywhere on the surface of its body though touch, heat and cold could be recognized. Is it possible that there were no sensory nerve endings adapted for the perception of pain stimuli? Are there specialized nerve endings for the perception of pain alone? This is of some importance for our thesis and again I turn to Foerster's book. Many arguments sustain the view that there is a specialized pain-perception system, but there

is as yet no evidence to prove that any one of the very many types of sensory end organs is specialized for the perception of pain alone. Such evidence as there is points in the opposite direction.

The pain with which we are most familiar comes to us from the skin surface as the result of cutting, sticking, burning, and pinching. We know equally well that pain may arise from injuries to deeper structures, bones, joints, tendons; not quite the same quality of pain and not set up by quite the same quality of injury, though they overlap. Stretching or pressure are more potent causes than cutting. These are stimuli which the deeper structures are more accustomed to perceive.

We are now beginning to realize, especially since the use of local anæsthesia within the abdomen and within the head, that there is scarcely an organ in the body from which pain sensations cannot originate. It is held by some writers, notably Kappis, that these sensations of pain arise not in the organs themselves but in the connective tissue about the organs. Especially is this true of the vessels, so much so that some regard all pain originating within the abdomen as vessel pain. There are, however, many reasons to believe, that many if not most of the pain paths pass through the sympathetic rami communicantes. Some of these will be referred to later, in discussing the localization of pain in the abdomen by blocking the rami with novocaine. It has also been shown that sensory end-organs are present in the stomach and intestinal wall and in other of the internal organs. This would indicate that afferent impulses can come from the organs themselves. These might be interpreted as pain, especially in hypersensitive states or hypersensitive individuals. It may well be that the ordinary pain stimuli, that is ordinary for the skin surface, such as cutting or burning, might not be so perceived, but that others, such as pressure, stretching being for the internal organs the more common stimulus, may be so perceived, especially in states of unusual irritability.

The afferent paths of the sympathetic system are now moderately well known. It is generally accepted among authorities that afferent paths capable of conducting pain stimuli come from the vessels and join mixed nerves, such as the sciatic, and that the fibres are arranged in a

segmental manner associated with spinal cord segments. Foerster believes that there is evidence to support the view that there is besides this a direct continuous path in the adventitia of the vessel through the sympathetic ganglia to the cord. In support of this he quotes a very interesting instance. The three lowest cords of the cervical plexus had been severed. This left the little finger insensitive on the surface, but not in the depth. He then dissected out the nerve and stimulated the proximal end with a strong electric current; there was no pain. He then laid bare the corresponding digital artery; irritation of this caused acute pain. The lesion in the cervical plexus was peripheral to the entrance of the sympathetic. It is difficult to see how else than by a direct path up the vessels this stimulus could be recognized.

There are several possible afferent paths from the abdominal organs by which painful sensations might reach the central nervous system.

1. They might pass by the splanchnics to join the cord through the posterior roots of the spinal nerves. Such afferent paths have been demonstrated from the stomach, intestine, pancreas, spleen, liver and gall bladder, to enter the cord from the 6th dorsal to the 3rd lumbar.

2. Impulses might pass up with the vessels and reach the cord by paths as high as the 8th cervical.

3. Or, as has been more generally held, the pain paths may be through the vagus or phrenic nerves.

That the splanchnic contains sensory and indeed pain paths can be shown by stimulating the central end of the cut splanchnic, and local infiltration of the celiac plexus, according to Leriche and Kappis, renders the whole peritoneum painless. This, of course, does not exclude the vagus as this would also be anæsthetized. Foerster states that stimulation of the central end of the cut vagus causes nausea, but not pain. After total section of the cord at the level of the 5th, 6th and 7th cervical vertebræ, sensation, but not pain, can be stimulated by irritation in the abdomen. Foerster concludes that the pain paths from the abdomen follow the afferent paths of the sympathetic through the dorsal roots.

Considerable evidence has accumulated, based on Head's work on the alterations in

sensation in visceral disease, and more recently on the studies of Kappis and Löwen, who by paravertebral injections of novocaine relieved pain associated with known disease of the intra-abdominal organs. It has been shown, with a fair degree of certainty, that the afferent path and, as we believe, the pain path, from the œsophagus enters the cord through the 5th and 6th dorsal roots; from the stomach through the 6th to 8th dorsal roots; from the liver and gall bladder through the 9th to 11th, and from the small and large bowel through the 10th dorsal to the 1st lumbar.

It was from a background such as this that von Gaza started. He elaborated the observations of Head and MacKenzie that disease of abdominal organs often makes itself manifest by disturbances of skin sensation. His method was to inject novocaine, to block the paravertebral nerves in known disease of intra-abdominal organs accompanied by pain. If relief followed this injection the presumption was that the pain paths passed through the blocked area. He comes to the conclusion, differing somewhat from Foerster, that the œsophagus corresponds to the D_5 to D_6 cord segment; the cardia to the D_6 to D_7 ; the stomach to the D_7 to D_8 (6 to 9?); the small bowel to the D_9 to D_{10} ; the colon to the D_{11} to D_{12} ; the liver and gall bladder to the D_9 to D_{10} ; the kidney to the D_{12} to L_1 ; the pelvic organs to the D_{12} to L_1 . He was able in thirty instances, in patients with well marked Head zones, to produce an anæsthesia of the Head's zone and at the same time a relief of the pain.

He came to the following conclusions in regard to the indications for sympathectomy.

1. An organic lesion must be definitely shown not to be present. This will mean as a rule exploration of the abdomen. It has usually already been done.
2. The site of the lesion must be established by a constant Head's zone of hyperæsthesia, together with the supporting evidence of the paravertebral novocaine injections.
3. The paravertebral injections must relieve the pain for at least an hour or two.
4. The paravertebral injections must always precede the operation, must be successful and must be repeated.
5. The resection of the paravertebral nerves may extend over at most two segments.

At this time von Gaza reported three successful cases. I know of no others except the two to be detailed to-night. In the first he resected the 10th paravertebral nerve; in the second he cut the rami communicantes D_9 to D_{12} ; in the



FIG. 1

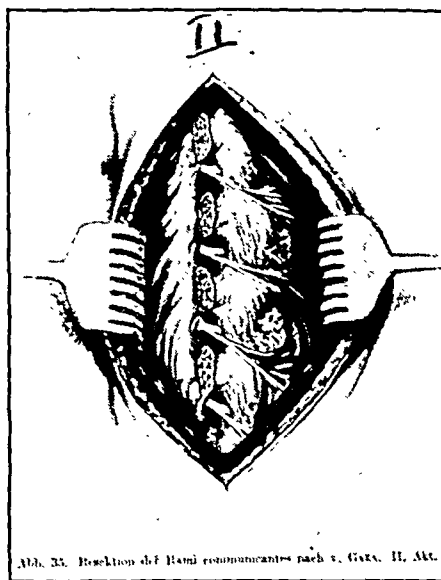


FIG. 2

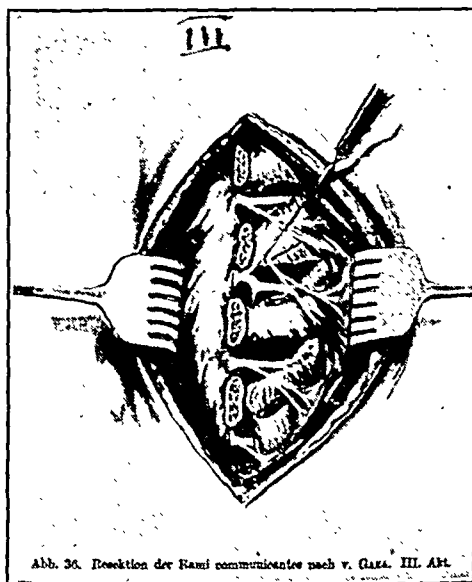


FIG. 3

Steps in the operation as described by von Gaza. Illustrations taken from his original paper.

third he cut the rami communicantes D_3 to D_6 .

The steps of the operation are theoretically simple and actually not difficult, at least in the areas usually required for intra-abdominal pain, D_6 to L_1 . My illustrations are taken from von Gaza's paper.

The incision is made in the back, about 3 cm. to the right or left of the dorsal vertebral spines, and must be long enough to give a good exposure of the transverse processes of the vertebrae. The muscles are separated off the vertebrae and held to the side until the transverse processes are seen. During this process the superficial branches of the nerves are preserved and act as guides. The muscles and tendinous attachments of the transverse processes are cut away by sharp dissection or by sharp raspatory. To display the paravertebral foramen, the transverse process must be removed. This is done by chiselling close to the body of the vertebra. During the removal of the transverse process care must be taken not to wound the pleura which lies close under the process. Into this space filled with fatty tissue the superficial branch of the paravertebral nerve disappears. The intercostal muscles are then cut outwards from three-quarters to one inch and the deep branch of the paravertebral nerve sought for. The fat is picked away and as the nerve is lifted on blunt hooks, if the dissection has been carefully done, the two fine nervi communicantes, white or grey, are seen passing almost vertically forwards towards the abdomen. They are about the thickness of sewing thread and join the paravertebral nerve

quite an appreciable distance from the union of the two roots. The root ganglion is not seen. There is no other nerve structure taking this course.

The two case reports I have to present which justify this review are as follows.

CASE 1

M. F., a female, aged 34, admitted in April, 1926, with a provisional diagnosis of neuralgia in the left side of the abdomen, from which she had been incapacitated for three years and bed-ridden for eighteen months. She had had a long and complicated history, covering many admissions to the hospital, through all of which runs the complaint of left-sided abdominal pain.

Her first admission was in 1895, when, at the age of three, there was diagnosed a tuberculous arthritis of the left knee. During the next fifteen years she was in the hospital ten times for this, and finally in 1911 a resection of the knee was carried out. It was about this time that the left-sided pain became prominent and various diagnoses were made; left-sided pleurisy with no objective signs; tuberculosis of the spine with no x-ray confirmation.

In February, 1912, the appendix was removed. In March, 1915, a fibroadenoma was removed from left mammary gland. In October, 1915, neurasthenia was diagnosed.

In October, 1916, early tuberculosis of the spine was suspected but no lesion demonstrated. In October, 1920, she was admitted to the urological department for pain in left side; no disease was found. In September, 1923, a left ovarian cyst and Fallopian tube were removed. In September, 1925, tonsillectomy was performed. In October, 1925, laparotomy; examination of the pelvis and abdomen revealed nothing pathological. Suspension of the uterus was done.

On April, 1926, she was again admitted to the urological department on account of left-sided abdominal pain. She had been in bed for a year and a half. The whole left side of the abdomen was pigmented brown from long and repeated hot applications. The urinary tract was found normal. She was then transferred to the general surgical service.

She was thin, irritable, and greatly depressed, screaming from time to time with pain, very impatient and difficult to manage, asking for morphine constantly.

Her examination revealed nothing except an area of hyperæsthesia in the left abdominal wall corresponding to the distribution of the tenth and eleventh dorsal nerves, and terminating at the mid line.

On May 7, 1926, a novocaine injection was made well distal to the entrance of the sympathetic. This resulted in a loss of sensation over the area which had been anesthetized, but with no relief of the pain.

On May 9, 1926, a paravertebral injection was done with anesthesia and there was relief of pain for one and a half hours.

May 25, 1926, a resection of the rami communicantes of the 10th, 11th, 12th dorsal and 1st lumbar was carried out. For the next ten days she was worse in every way. Her back was painful, her complaints were bitter, the operation had made her worse and she desired to die; but at the end of that period when the soreness of the wound subsided she began to realize that the "old pain was gone." In three weeks she was about the ward, a most grateful patient. She has continued her work ever since not entirely free from all pain. She has been in the hospital twice since, once for frequency of urination for which no cause was found, and once for the removal of the uterus not she tells me for the "old pain which has not recurred" but perhaps from force of habit.

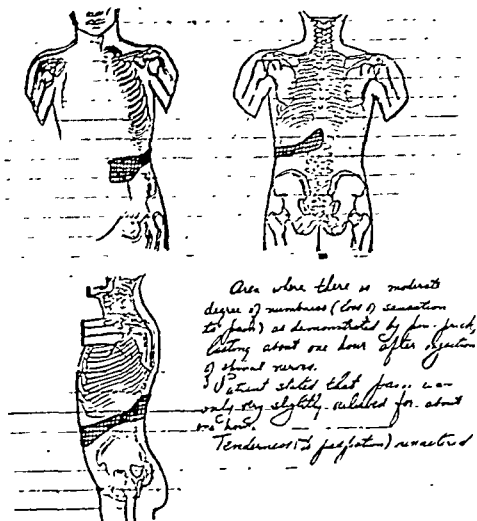


FIG. 4.—Head zones as found in Case 1.

CASE 2

Mrs. D. S. (No. 63853), admitted November, 1927.

First hospital admission for pain in the right side of the abdomen, 1919, when the appendix and right ovary were removed.

She was re-admitted for pain in the right side of abdomen supposed to be due to diseased kidney. The right kidney was exposed and sutured up in place. The pain continued.

Re-admitted, complaining of pain in the distribution of the 10th and 11th nerves. A colopexy was done but without relief of pain, and later a resection of the 10th and 11th nerves in the loin was done. Her pain continued.

In June, 1927, a paravertebral block of the 9th to 12th segments under novocaine caused the pain to disappear for two hours.

She returned in November of 1927 still complaining of pain in the right side. On examination the area supplied by the 10th and 11th nerves was anaesthetic. The pain was so severe as to frequently cause her to be confined to bed for periods of two to three weeks. She then had relative relief, though she was never free from pain.

On November 25, 1927, rami-section of the 9th to 12th dorsal segments was carried out according to the von Gaza operation. She had immediate relief of pain which remained entirely absent until March of 1928 when there was a recurrence for four days. She then had relief till September, 1928, when there was again some return of pain but not sufficient to keep her from work.

In January, 1929, she reported that she was free from pain most of the time, but had occasional returns of less degree but never sufficient to prevent her doing her work.

SUMMARY

There is convincing evidence that afferent impulses are conveyed through the sympathetic nervous system and reach the consciousness to be perceived as pain. This is especially clear in regard to the sympathetic paths in the adventitia of vessels, and it is probably true that such distribution is segmental and may reach the cord either by nerves joining the mixed nerve trunks at intervals from the vessels, or that there are direct paths following the vessels to the sympathetic ganglia and so relayed to the cord. This seems to explain the erratic results which follow a periarterial sympathectomy. This procedure, though unpopular at the moment, offers evidence which is hard otherwise to explain and which the careless pronouncement of "psychic" does not explain.

There is every day experience of pain referred to and arising in the organs contained within the abdomen. For this there are several possible routes; the periarterial paths; the vagus and phrenic nerves; and the more direct sympathetic path through the posterior root to the cord. There is clinical and experimental evidence to suggest that the main paths by

which pain is perceived pass through the posterior root, and that the different abdominal organs are associated in this way with vertebral segments.

It has been shown that sensory end organs are present in most of the abdominal viscera, and that these are comparable with the sensory pain receptors in the peripheral systems.

There has further been demonstrated an anatomical mechanism by which such afferent impulses may enter the posterior root from the sympathetic ganglia and synapse around cells of the posterior horn.

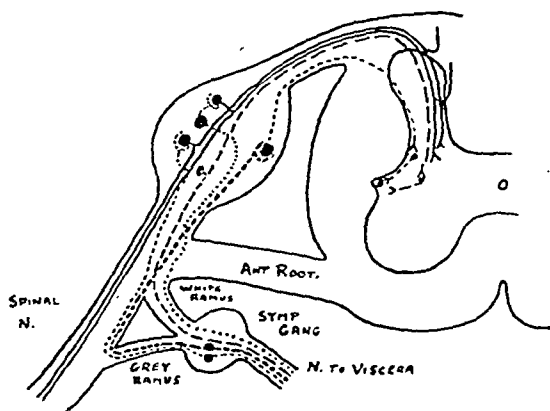


FIG. 5.—Afferent sympathetic paths. Diagram by Prof. Beattie.

The afferent sympathetic fibres enter the spinal nerve by two routes; the white and the grey rami. The fibres entering by the white ramus have the cell body in the posterior root ganglion. The fibres from these cells take either one of two ways of termination: (a) by entering the spinal cord directly through the posterior root and probably terminating around cells in the cord which, in their turn, are connected with cells from which arise the preganglionic nerve fibre; (b) the cell body gives off a short fibre which ends by breaking up into a pericellular network around the cell body of a neurone in the posterior root ganglion. The neurone around which such a fibre terminates is a *somatic* and not a *sympathetic* neurone.

The fibre entering by the grey ramus is believed to have a cell station in the sympathetic ganglion itself. The central process of this cell terminates in one of two ways: (a) by forming a pericellular network around small cells in the posterior root ganglion, which send processes into the spinal cord where they probably terminate around cells in the posterior

horn; these small cells have no peripheral fibres; they are unipolar cells.

(b) The fibre in the grey ramus passes into the posterior root ganglion and terminates around the cell body of a sensory neurone.

These are all the methods of termination of sensory sympathetic neurones which have been described. It is probable that by far the greatest number of sympathetic afferent fibres are analogous with somatic afferent neurones, that is, they have a cell body in the posterior root ganglion, a peripheral fibre lying in the white ramus, and a central fibre in the posterior root which enters the spinal cord and ends around a posterior horn cell. A smaller number have the cell body in the sympathetic ganglion and a central fibre which terminates in the cell in the root ganglion and so leads impulses to the cord. Others synapse around

the cell in the root of the somatic sensory path, and so project the sensation of pain to the corresponding cerebrospinal distribution, thus producing the Head's zone of hyperæsthesia. We have then a mechanism reasonably assured which makes anatomically probable our clinical and experimental observations.

Given a constant source of irritation in an individual of excessive sympathetic irritability, is it not possible that we should be able to relieve pain by severing the corresponding paths of entrance to the cord, in cases when that pain arises from organs showing no gross disease, or where such disease is not locally remediable?

I am indebted to Dr. John Beattie for his assistance in the demonstration of the anatomical pain paths and for the illustration showing these possible paths.

THE RADIOLOGICAL EXAMINATION OF THE HEART AND GREAT VESSELS*

By DIGBY WHEELER, M.A., M.D., C.M., M.R.C.S., L.R.C.P.,

*Associate Radiologist, Winnipeg General Hospital; Formerly Lecturer in Anatomy,
University of Manitoba,*

Winnipeg

"THE inspection and the palpation of the movements of the heart and the percussion of the heart's dullness give a far more valuable indication of the size of the different chambers of the heart than an x-ray examination. Indeed I am doubtful if any x-ray examination of the heart has ever thrown the slightest light upon any cardiac condition." This sweeping and unqualified condemnation was made by Sir James MacKenzie. It is quoted from the "Oxford System of Medicine," of which he was chief editor. One pauses before attempting to refute the opinion of so eminent a cardiologist, especially when his view is upheld by many prominent internists. Yet very few physicians seem aware of the information, both confirmatory and supplementary, which may be derived from an x-ray examination of the heart. Recent text-books

and literature on the heart almost completely ignore radiological findings.

Twenty-five years of progress in cardiac radiology have proved that the x-ray may give information of definite clinical value which cannot be determined in any other way. Moritz, of Germany, and Vaquez and Bordet,¹ of France, were the pioneers. The results of work in this field on this continent are presented in the monograph of Van Zwaluwenburg and Warren,² the articles of Hodges and Eyster,³ Karshner and Kennicott,⁴ Wilson and Merrill,⁵ Levi,⁶ Langley,⁷ and Pendergrass.⁸

Van Zwaluwenburg,⁹ in a letter to his friend, Dr. A. W. Crane, expressed what many radiologists feel: "I think my irritation is altogether in consequence of the failure of the medical profession to recognize the value of this method of cardiac examination. Undoubtedly men have not wished to take the time to learn the trick or to do the work when other more immediately profitable work was at hand. Be-

* From the Radiological Department, Winnipeg General Hospital. Read before the Winnipeg Medical Society, November, 1928.



FIG. 5.—Normal heart in the anatomical position—right lateral. Chambers injected.

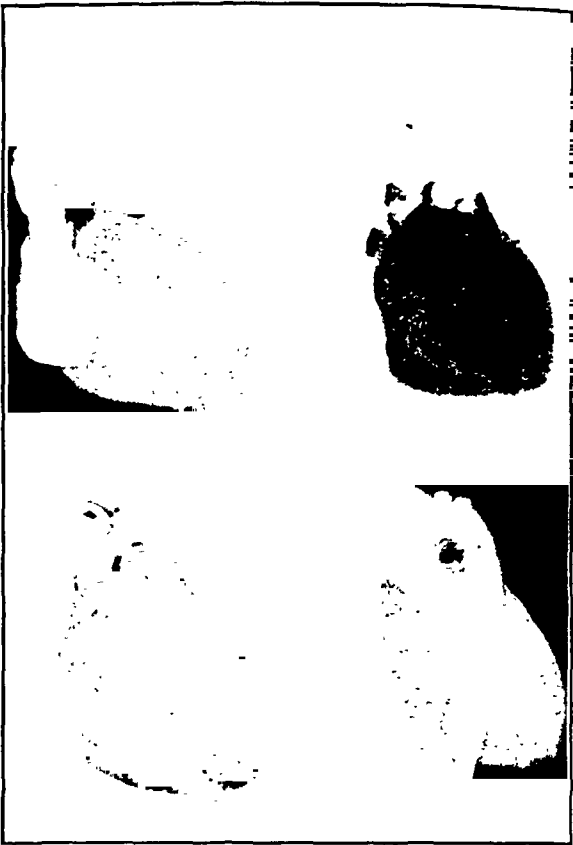


FIG. 7.—Normal heart in the anatomical position—antero-posterior. Chambers injected.



FIG. 6.—Normal heart in the anatomical position—right anterior oblique. Chambers injected.

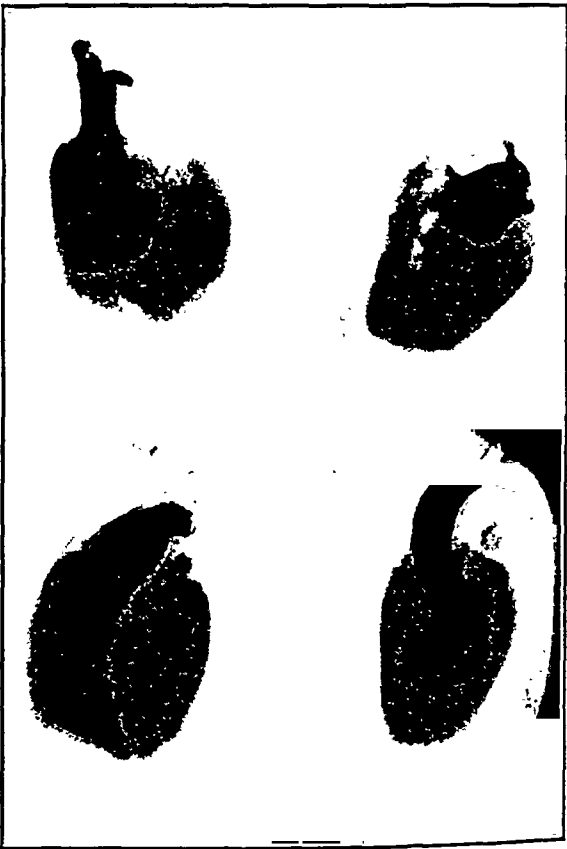


FIG. 8.—Normal heart in the anatomical position—left anterior oblique. Chambers injected.

of the arch and the thoracic aorta; the inferior border, by the right ventricle and the left ventricle.

It was thought that information of value would be obtained if the chambers of a normal heart were injected separately with an opaque solution and then radiographed. The extent to which each chamber contributes to the cardiac shadow in each plane is easily seen in Figs. 5, 6, 7, and 8.

The technique of these injections is quite simple. Water was added to barium sulphate and flour until the mixture would flow easily from a 100 c.c. syringe. For the injection of the right atrium the cusps of the tricuspid valve were firmly sewn together, it being desired to inject only one chamber at a time. A similar procedure was followed for the injection of the other chambers of the heart.

A study of these injections would lead one to think that the capacity of the right ventricle is considerably greater than that of the left. In a normal heart this, of course, cannot be true, because the output of both ventricles must remain equal, otherwise there would be a piling up in one or other circulatory system. Fig. 8 throws some light on this difficulty, inasmuch as it shows that the right ventricle has a wide cavity but a very narrow diameter antero-posteriorly. It simply embraces the thick-walled left ventricle.

Figs. 9 to 11 represent an analysis of the cardiac silhouette, and the variations which may occur in this silhouette due to the enlargement of the chambers of the heart or great vessels.

The normal anatomical outline is represented by the heavy lines. The alteration of the silhouette which may occur, due to enlargement or dilatations of any chamber or great vessel, is suggested by the dotted lines.

Fig. 9 shows the position of the posterior cardiac sulcus. Obliteration of the sulcus in the upper third suggests some enlargement of the ascending aorta; in the middle third, some enlargement of the left atrium; and in the lower third, some enlargement of the right atrium. It is in this position that the most accurate estimation of the width of the aorta can be made. The enlargement of the right ventricle anteriorly is, of course, restricted by the thoracic wall.

Fig. 10 suggests that alteration in the right border does not necessarily mean an enlarged

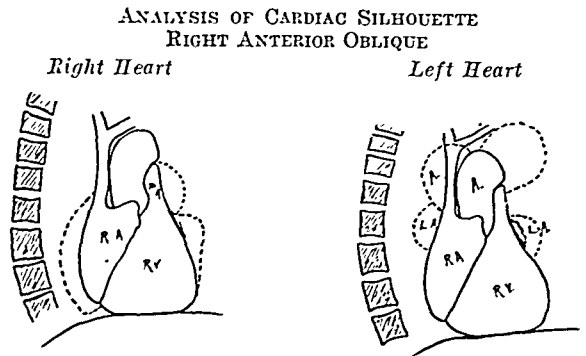


FIG. 9

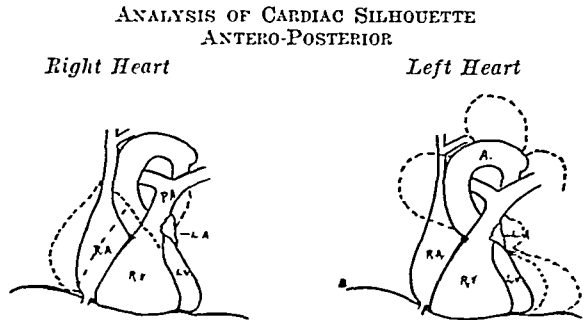


FIG. 10

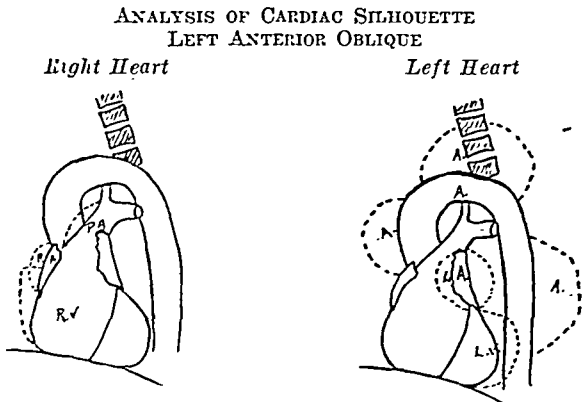


FIG. 11

atrium, but is due to the right atrium and the coronary sulcus being pushed to the right by an enlarged right ventricle. Two types of left ventricular enlargement or hypertrophy are suggested, the inner dotted line being the snub-nosed heart of essential hypertension, the outer dotted line the "cor bovinum" of aortic incompetence.

Fig. 11 gives a complete view of the arch and descending aorta. The transverse sinus appears as a clear space beneath the arch.

PATHOLOGICAL CONSIDERATIONS

Figs. 12 to 15 illustrate the assistance that radiological examination may give in the diagnosis of heart disease.

Fig. 12.—The right anterior oblique view shows obliteration of the posterior cardiac sulcus in the upper third and marked increase in the width of the aorta.

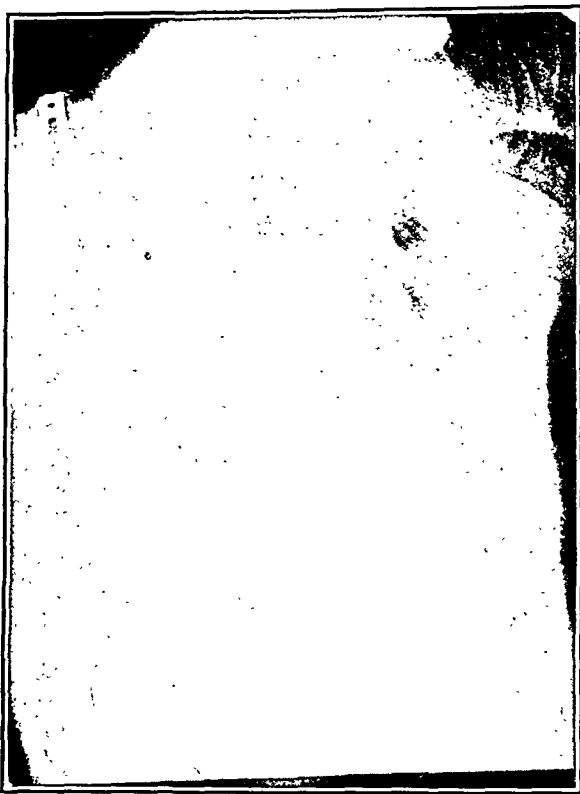


FIG. 12.—Increased width of the aorta—right anterior oblique position.



Fig. 13.—Left ventricular enlargement; increase in width of ascending aorta; aneurysm of ascending aorta. Antero-posterior view of same patient as in Fig. 12.

Fig. 13.—This antero-posterior view (same patient as in Fig. 12) shows marked left ventricular hypertrophy, marked increase in the width of the ascending aorta, and an aneurysmal dilatation extending to the right from the ascending aorta.

Fig. 14.—Right anterior oblique position shows a prominent pulmonary artery. This patient had a congenital heart lesion and because of the enlargement of the pulmonary



FIG. 14.—Enlarged pulmonary artery, patent ductus arteriosus—right anterior oblique position.

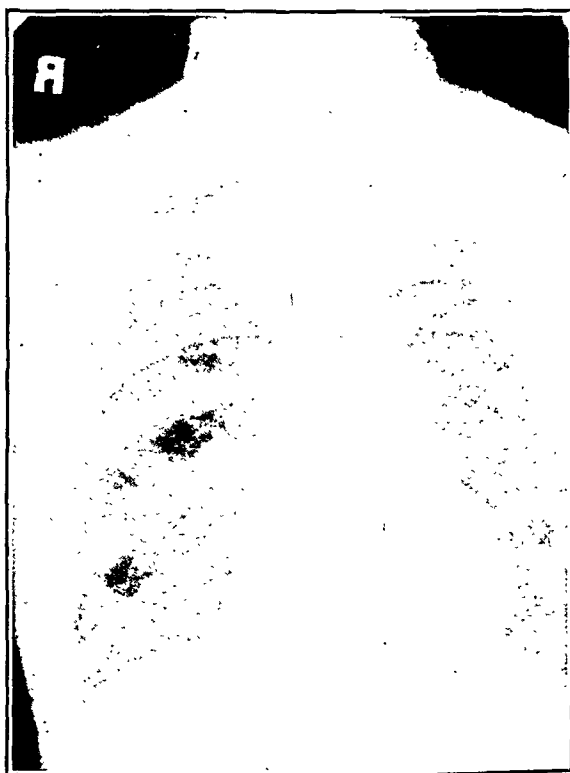


Fig. 15.—Left ventricular hypertrophy, essential hypertension—antero-posterior position.

artery the possibility of a patent ductus arteriosus was suggested. This was later confirmed at post-mortem.

Fig. 15 illustrates left ventricular hypertrophy due to hypertension. The left ventricle presents a snub-nosed appearance.

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DIFFERENTIATION OF PLASMA CELLS FROM MAST CELLS IN THE INTESTINAL MUCOSA OF THE WHITE RAT*

By E. N. BALLANTYNE, M.D.,

From the Department of Anatomy, University of Western Ontario,

London, Ont.

CERTAIN cells in the mucosa of the white rat's jejunum contain cytoplasmic granules which may be stained metachromatically with stains of the thionin group. These cells are found between the glands, within the villi, and also to some extent in the submucosa. They have been described as "mast" cells by Maximow,¹ Sansonow,² and Weill.³ It is the purpose of this paper to show that they are really plasma cells.

TECHNIQUE

Tissues were fixed by immersion for at least a week in 20 per cent formol, saturated with magnesium carbonate and containing 0.75 per cent sodium chloride. They were then washed for only a few minutes in distilled water, after which frozen sections were cut, 15 microns in thickness. For differentiating plasma cells from mast cells I have used Ehrlich's specific mast cell stain and Unna's differential orcein method. To stain the granules in both plasma cells and mast cells at the same time I have used aqueous solutions of thionin, toluidine blue, and polychrome-methylene blue. Cut sections were stored for periods of varying duration in distilled water, 0.75 per cent sodium

chloride solution; saturated solution of magnesium carbonate; 0.75 per cent sodium chloride solution saturated with magnesium carbonate; and various other solutions. The influence upon the subsequent staining of plasma cell granules and of mast cell granules was noted. Distilled water, ether water (1 drop of ether to 5 c.c. of distilled water), or saturated solution of magnesium carbonate, with or without 0.75 per cent sodium chloride, were used for differentiation. Sections were mounted in 50 per cent aqueous glycerine, euparal, or balsam. Dehydration was accomplished by dropping alcohol upon the section spread out on the slide ready for mounting. Metachromatic colour shades are best detected in these comparatively thick frozen sections with a mild artificial light and without the use of a blue glass. I used an ordinary 40-Watt interior frosted nitrogen bulb.

RESULTS

I have been unable to find any mast cells in the mucosa or submucosa of the rat's jejunum, either by Ehrlich's specific method or by Unna's method for differentiating mast cells and plasma cells, although in almost all cases I have been able to find from two or three to a dozen in the stump of the mesentery. Since I have been able to find mast cells in considerable numbers in the submucosa of the rat's large

* Presented before the forty-fifth session of the American Association of Anatomists at Rochester, N.Y., March 27, 1929. See abstract in *The Anatomical Record* 42: 4, March 25, 1929.

intestine, one might expect to find them also in the submucosa of the jejunum, but I have been unable to find a single example in my sections. The inability to find any cells in the mucosa or submucosa of the rat's jejunum which stain as mast cells by Ehrlich's or by Unna's method appears to justify the conclusion that no mast cells (of Ehrlich) are present in this location, or, at least, if present they are very rare.

Since no mast cells (of Ehrlich) are present in the mucosa of the rat's jejunum I believe that the cells formerly described as mast cells

in this location are really plasma cells, for the following reasons. (1) Unna's differential staining method reveals the presence of numerous plasma cells in the mucosa and submucosa. These plasma cells correspond to the so-called mast cells in distribution, size, and shape, and in the position of the nucleus and the proportion of nucleus to cytoplasm. The nucleus is usually eccentric. The cytoplasmic area is usually much greater than that of the nucleus. The shape varies from oval to polyhedral. The size varies considerably, but in general the plasma cells are the largest and most con-

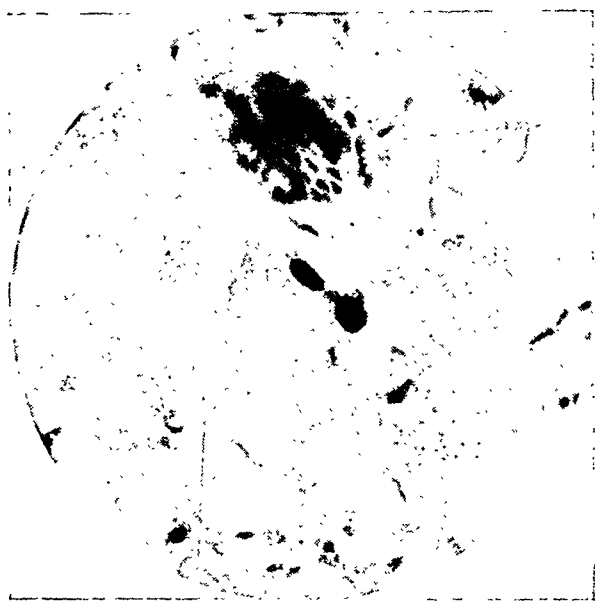


FIG. 1.—Mast cells in the mesentery of a white rat; Ehrlich's specific mast cell stain. X320.

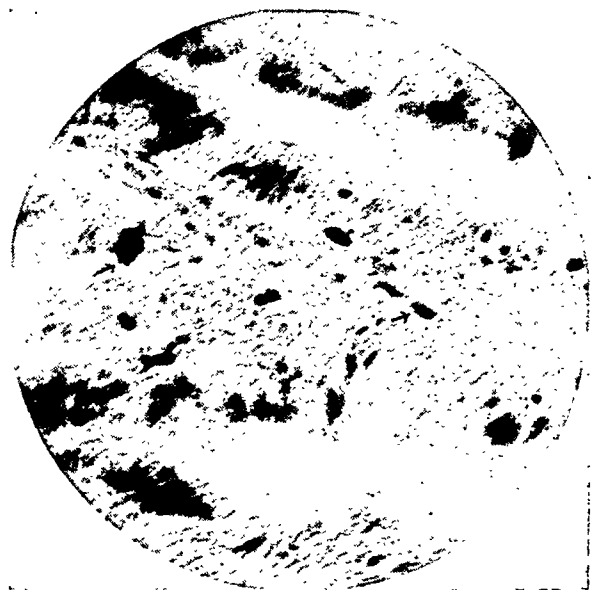


FIG. 3.—Villus, white rat's jejunum; non-specific thionin stain. Note the dense granular plasma cells in the intravillous tissue. X320.

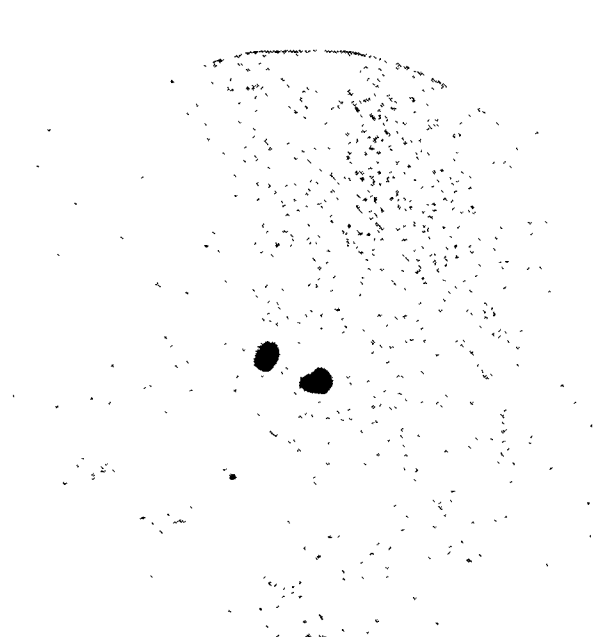


FIG. 2.—Mast cells in the mesentery of a white rat; non-specific thionin stain. X320.



FIG. 4.—Villus, rat's jejunum; Unna's differential stain for mast cells and plasma cells. Note the absence of mast cells and presence of numerous plasma cells. X320.

spicuous cellular elements present within the villi and between the glands. They are the only cells which do correspond to the so-called mast cells in all these particulars. (2) With thionin, toluidine blue, and polychrome methylene blue all grades of transition may be seen at times, from plasma cells with diffusely staining cytoplasm, either metachromatic or non-metachromatic, to cells showing granules with varying degrees of distinctness. Indeed, in some cases cells have been seen showing diffusely staining cytoplasm in one pole and metachromatic granules in the other. As the number of cells showing metachromatic granules increases with improvements in the technique, the number of diffusely staining basophilic cells decreases. In some cases I have been able to show granules in nearly all the cells of a given section which looked at all

cleus. While this is not of itself diagnostic of a plasma cell, taken along with other morphological features it contributes to the diagnosis. One such morphological feature which we have noted is the presence in these plasma cells with metachromatic granules of vacuoles or clear areas such as are described as typical of plasma cells. I have also noted in some cases the perinuclear clear area referred to frequently in descriptions of plasma cells. (4) Sketches to show the position of cells with metachromatic granules were made after toluidine blue staining. The sections were then destained with alcohol and restained with hæmatoxylin. The result was that the cells which previously showed metachromatic granules now showed a diffusely staining basophilic cytoplasm, and otherwise presented an appearance typical of plasma cells. I feel, therefore, that the evidence here submitted is sufficient to warrant the conclusion that these metachromatic granular cells in the mucosa of the rat's jejunum are really plasma cells.



FIG. 5.—Interglandular region rat's jejunum; non-specific toluidine blue stain, showing cytoplasmic granules and nuclear detail in a plasma cell. X720.

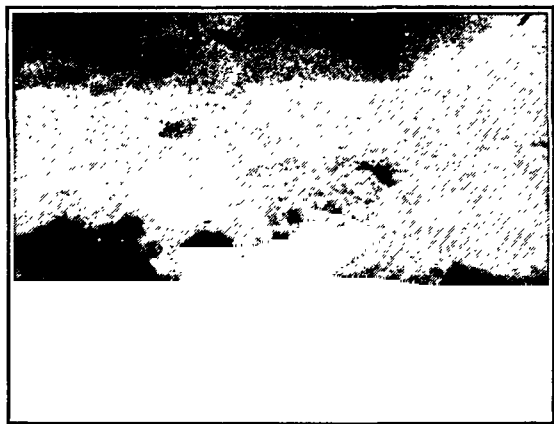


FIG. 6.—Enlargement of the plasma cell shown in Fig. 5. Note cytoplasmic granules and nuclear detail. X2160.

like plasma cells. However, not all the plasma cells show basophilic metachromatic granules and the proportion has varied even with the best technique. The probable explanation for this will appear in the discussion. (3) The nuclear detail is usually not visible in plasma cells stained to show metachromatic granules, but in some preparations it has been well shown, particularly with toluidine blue staining and glycerine mounting. In these cases the chromatin has always had the distribution characteristic of a plasma cell nucleus, the so-called "cart-wheel" or "checker-board" nu-

The authors^{1, 2, 3} who have described these cells in the mucosa of the rat's jejunum as mast cells have noted certain differences between them and typical tissue mast cells. The granules are finer, more variable in size, and do not fill the cytoplasm of the cell so completely. Maximow¹ says that during fixation and staining the tissue must not come in contact with water or aqueous solutions or the granules will be dissolved more or less. I find that although the granules of the plasma cells are lost to some extent in distilled water or hypotonic sodium chloride solution, either be-

fore or after fixation, they are comparatively well preserved in 0.75 per cent sodium chloride solution, especially after fixation. Mast cell granules, on the other hand, are unaffected by immersion for several days in distilled water after fixation.

I find, also, that slight alkalinity is essential for the staining of plasma cell granules by the methods which I have employed, with the exception possibly of a very occasional cell. Even exposure of one hour to the very slight acidity of distilled water is sufficient to prevent their staining. This is shown by the fact that the ability of the granules to take the stain may be restored by about fifteen minutes immersion in a weakly alkaline solution (saturated solution of magnesium or lithium carbonate, or 0.25 per cent potassium carbonate or sodium bicarbonate), except in the case of cells whose granules have been already permanently damaged. On the other hand mast cell granules are stained well after eighteen hours in a strongly acid solution. (Ehrlich's stain contains about 7 per cent acetic acid. Indeed the specificity of Ehrlich's stain seems to be due to the acetic acid which it contains, since I have been able to substitute thionin, toluidine blue or polychrome methylene blue for the dahlia in Ehrlich's formula without loss of specificity so far as the differentiation of mast cells and plasma cells is concerned). While exposure of about fifteen minutes to a weakly alkaline solution is essential to the staining of plasma cell granules, an exposure of eighteen hours or more usually damages the granules to a certain degree. The granules of the mast cells on the other hand are comparatively resistant to this treatment. On the whole, I have found that the most convenient storing fluid for the preservation of plasma cell granules in cut sections is 0.75 per cent sodium chloride solution saturated with magnesium carbonate. In the presence of the sodium chloride the granules are protected from the destructive action of the alkali, and it is only necessary to immerse the sections for 45 seconds in a saturated solution of magnesium carbonate to rid them of sodium chloride previous to staining. I have noted certain differences, also, in the reaction of mast cell granules and plasma cell granules towards mounting in different mounting media. Aqueous glycerine (50 per cent) gives a red or reddish purple colour to the granules of both mast and plasma

cells, and is a particularly favourable medium for showing detail of the granules and the nucleus. Often by this method the nucleus is well stained, particularly in the plasma cells and with toluidine blue staining. Unfortunately the stain fades, especially on exposure to strong artificial light and apparently more on exposure to certain light filters. Euparal preserves a metachromatic colour in the mast cell granules and usually in the plasma cell granules, although in the latter it may be lost to some extent, particularly after toluidine blue staining. The stain fades also in euparal, but not so readily as in glycerine. The metachromasia is retained in the mast cell granules after mounting in balsam, but is usually lost or only faintly retained in the plasma cell granules. The metachromasia is somewhat better retained in the plasma cell granules, mounted in balsam, when oil of bergamot is used instead of xylol, but even then the results are usually disappointing.

The above constitute important morphological and physico-chemical differences between mast cells and plasma cells which may well be associated with important differences in function.

DISCUSSION

It is significant that although Maximow¹ noted plasma cells in the mucosa of the rat's intestine, he did not find them in large numbers, presumably because he was staining most of them as metachromatic granular cells and calling them mast cells. He also noted that the number of these metachromatic granular cells to be seen varied with the perfection of the technique. He expressed some doubt as to the proper classification of these cells. He says, "Es sind also scheinbar keine gewöhnlichen histogenen Mastzellen. Andererseits sehen sie auch den weiter unten beschriebenen hämatogenen Mastzellen der Ratte nicht ähnlich. Es wird also wohl eine besondere Mastzellenart von unbekannter Herkunft und Natur sein."

In addition to what he calls mast cells in the rat's intestinal mucosa Weill² has described cells with eosinophilic granules and a round or oval wheel nucleus. These cells he termed myelocytes. He makes no reference to plasma cells in this location in the rat although he does describe them in other species in the same article. These may have been plasma cells with eosinophile granules and may correspond to

part or all of the residue of the plasma cells in which I was unable to demonstrate metachromatic granules in my preparations.

Mast cells (of Ehrlich) should always be differentiated from plasma cells by specific methods. Failure to do so has left in doubt the identity of certain cells which have been described as mast cells in a considerable part of the literature on the subject. For example, mast cells have been described, following the use of non-specific methods, in the intestinal mucosa of other species, as the white mouse, dog, cat, (Maximow¹) and guinea pig (Weill³). A portion of the cells described as mast cells in the subcutaneous tissues of the white mouse (Broderson⁴) and in the bone marrow of the white rat (Maximow⁵) may be plasma cells. That this necessity for specific differentiation applies to other species than the rat is indicated by the fact that Krompecker^{6*} and Michels and Globus⁷ have found a similar type of granular plasma cells² in human material.

SUMMARY

1. I have been unable to find any mast cells (of Ehrlich) in the mucosa or submucosa of the white rat's jejunum.

* Although Krompecker says decidedly that these cells are true plasma cells, he calls them plasma mast cells. I think this is an unfortunate designation, because it combines two terms which should be kept separate and distinct, since they each separately refer to cells which should be carefully distinguished one from the other. This applies even although it should be shown at some later date that mast cells and granular plasma cells are very closely related types.

THANKSGEUNG TO GOD FOR WITHDRAWING AND
CEASING THE PLAGUE, 1563.—Wee yield the hartie thankes,
O most mercifull father, that it hath pleased the in thy
wrayth to remember thy mercie, and partlie to mittigate
thy severe rodde of this terrible plague, wherwith thowe
hast hitherto most justly scourged vs for our wickednes,
and moste mercifully revoked vs from the same. Calline
vs (who in healthe and prosperitie had cleane forgotten
bothe the and ourselves) by sicknesse and adversitie to
the remembrance bothe of thy iustice and iudgmente and
of our owne miserable fraylenes and mortalitye: and
nowe leaste wee by the heavines of thyne indignation,
shulde have utterly despayred, comfortinge vs aigayne
by the manifeste declaration of thy fatherly inclynation to
all compassion and clemencie. Wee beseche the to per-
fecte the works of thy mercie gratioously begone in vs:
and forasmoche as trewe healthe is, to be sownde and
troow in that parte, which in vs is moste excellent, and

2. Cells formerly described as mast cells in this location are really plasma cells with basophilic metachromatic granules.

3. Mast cell granules stain metachromatically in a strongly acid solution, while plasma cells do not. Plasma cell granules require exposure to a weakly alkaline solution before they will stain metachromatically in aqueous solutions of stains of the thionin group. Mast cell granules do not require such treatment.

4. After fixation, plasma cell granules are well preserved in a 0.75 per cent sodium chloride solution saturated with magnesium carbonate, but not in distilled water, or a solution of magnesium carbonate. After fixation mast cells are well preserved in any of these solutions.

5. Considerable confusion exists in the literature on mast cells through failure to differentiate plasma cells from mast cells by specific methods.

I wish to thank Dr. C. C. Macklin for his kindly advice and encouragement.

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like to thy godheade; we praye the throughly to cure and heale the woundes and diseases of our sowles, greuously wounded and poysoned, by the deyly assaults and infections of ye olde serpente Saitan, with the deadly plagues of synne and wickednes: By the which inwarde infection of our myndes these outwarde diseases of our bodyes have by ye order of thy justice, O Lord, issued and followed, that wee by thy fatherly goodnes and benefytt, obteyninge perfecte health bothe of our myndes and bodies, maye render vnto the therefore contynewall and moste hartie thankes, and that, by flyenge from sinne, wee maye avoyde thyne anger and plagues, and ever hereafter, in innocencie and godlynnesse of lyffe studienge to serve and please the, maye bothe by our wordes and works allwayes glorifye thy holly name. Which wee hesech the to graunt vs, O father of mercies and goode of all consolation, for thy deare sonne, our only saviour and mediator, Jesus Christs sake. Amen.—*Lancet*, 1929.

TERATOMA OF THE NECK

BY HOWARD SPOHN, M.B.,

Vancouver

CONGENITAL tumours of the neck, excluding cysts and inflammatory enlargements, are extremely rare, and mixed tumours of the neck, or teratomata, are probably the most infrequent of all congenital neck tumours. On this account the case reported is of interest. Most of the teratomata of the neck arise in the thyroid, but show numerous other forms of tissue, such as primitive thymus tissue, cartilaginous and bony tissue, gastric gland tissue, brain tissue, etc.

A search of the literature emphasizes their infrequent occurrence. Steffen,¹ in a compilation of 880 tumours of early life, found three cases arising in the thyroid (or 0.38 per cent). Poult,² reported a case in a child 6½ weeks old and collected from the literature five other cases of teratoma of the thyroid in children, and eight teratomata of the neck in children, these last not being connected with the thyroid. Of the latter group, some were external pedunculated tumours. One ruptured during delivery and contained bones and hair; another recurred several times after operation, and contained bones, teeth and striped muscle. Flesch and Winternitz³ reported two cases, one in a female of eight months and another in a female of two months. In both cases the tumour had replaced the thyroid isthmus.

Hunziker⁴ reported a triphyllic tumour of the neck, which was so large that perforation of the cranium was performed to complete delivery. Hunziker regarded such mal-developments as due to tissue misplaced by the formation of the gill-clefts. Ehlers⁵ reported a tridermic teratoma of the neck removed surgically from the right side of the neck of a male child of nine weeks. He ascribed the mixed tumours of the neck and thyroid to tissue misplaced by the descent of the middle thyroid "anlage" which forms the isthmus.

In 1887 Sir Frederick Treves⁶ at a meeting of the Pathological Society of London, showed a specimen of cartilaginous tumour observed in a girl aged three. "It was situated on the left side of the neck, and had been noticed from

birth; it was just over the sternal end of the sterno-mastoid muscle. When removed it was seen to be a round rod, flattened at the end towards the sterno-clavicular articulation. It was in the line of the fourth branchial cleft. A fissure or tag of skin in this situation was not uncommon, but a subcutaneous, cartilaginous mass was most unusual, except in connection with the walls of a fistula or with a skin tag. A fibrous cord connected with the mass passed deeply towards the spinal column. The President recalled no similar case of cartilaginous growth without a fistula. Mr. Bland Sutton said that he had seen a young woman in whom there was a large mass on each side of the neck at the anterior aspect of the sterno-mastoid muscles resembling and probably representing supernumerary auricles. Mr. Birkett had described a very similar case in the *Transactions of the Society*."

F. Bolton Carter⁷ reported a case as follows: "The child, a female, was born at full term with a large multilocular semi-cystic, semi-solid tumour, of about the size of a small coconut, occupying the whole of the front of the neck. It caused no trouble during parturition. The child only lived one month, the mass being dissected out after death; the hyoid bone was partly included within its structure and most of the muscles of the front of the neck were inserted and lost in the tumour. Microscopically, it was seen to consist of glandular spaces lined with epithelium, cartilage, fibrous, and connective tissue and was described by Mr. J. H. Targett of the Clinical Research Association as a true teratoma of the neck."

D. W. Daniels⁸ reports another case in the *British Journal of Surgery*, "A male child was born on May 30, 1927, having a large swelling of the left side of the neck. This extended from the ramus of the jaw above to just above the clavicle below. It varied in consistency, in places being hard and in others fluctuating. It did not extend beyond the middle line. As the child grew the tumour kept pace, and, projecting

under the jaw, interfered with feeding. It was decided that removal should be undertaken.

On July 7th, Dr. S. Littlewood anæsthetized the child, and, with the assistance of Dr. G. T. Elder, the growth was removed. The tumour was in the left lobe of the thyroid gland—in fact it made up the whole of that lobe, so far as could be seen. There may have been some normal thyroid tissue behind, but it was not apparent. Enucleation was possible to a great extent, except where the superior and middle thyroid arteries ran into the growth with a certain amount of tissue. There was very little hæmorrhage, but at this stage the child was in a poor condition, so the operation was concluded by clamping and ligaturing the vessels at the posterior border. The child picked up rapidly after the operation, but showed chest signs twenty-four hours later and died on July 9th.

Pathological Report.—The tumour was about four inches long and was shaped like a potato. It contained some cysts. A specimen was submitted to the Clinical Research Association, and Dr. E. W. Bowell reported as follows: "The tissue does not resemble normal thyroid even in its embryonic form. It consists of a fine reticulum composed of relatively large cells with branching cytoplasm; a few leucocytes are seen wandering in its meshes. This structure occurs in regular masses which show some appearance of twisting as though they belonged to a more complex organ. Blood vessels are scantily represented, except in the central parts of the twisted structure and in the loosely made capsule of fibrous tissue which encloses it. Here and there are seen irregularly shaped spaces lined with a special epithelium, which in favourable cases shows large round nuclei like those of the typical thyroid gland, lying at the base of an elongated clear cytoplasm resembling that of a mucinous epithelium. In some places the epithelium appears to be ciliated. The tissue is abnormal and may be called a teratoma. It resembled the primitive thymus in several particulars and may be a displaced portion of that organ. There is no evidence, in the tissue itself, that it is malignant."

The mixed tumours of infancy and childhood occur in many locations, the urogenital tumours being the most frequent and the kidney much the most frequent location. The teratomata at

the poles of the body occur next in frequency and of these the cranial teratomata are the most complex and serious from an operative point of view.

The branchial cysts and fistulæ are not included in the mixed tumours of the neck. They occur usually in the second, third, and fourth branchial clefts, which have their external orifices along the anterior margin of the sterno-mastoid muscle. The opening of the second cleft is at the level of the angle of the jaw and a fistula in this location gives most trouble. Internally it opens into the tonsillar space. The removal of the fistula and closure of the pharyngeal opening is a most difficult surgical procedure, as the tract is usually described as passing into the pharynx between the external and internal carotid arteries. The third and fourth clefts enter the upper part of the pharynx and the superior laryngeal nerve may be injured in attempting to remove fistulæ. The cysts of the second cleft are rather common and may be difficult to distinguish from a node in this location on account of the thickness of the wall which is composed of fibrous, lymphoid, and epithelial coats.

The mixed tumours of childhood are frequently present at birth and have been described in fetuses as early as the third month of pregnancy. These tumours may be regarded as congenital, even though, through delayed development, they are not observed until late childhood or adult life.

The terms teratoid tumour, teratoma, embryoma or dermoid have been used to describe such growths and attempts have been made to differentiate between them, but these terms are for practical purposes synonymous. Probably the term "mixed tumour" is the most comprehensive, as designating a tumour showing more than one derivative of a single germ layer—or derivatives of more than one germ layer.

I have reported the cases given above in detail as there are so few in medical literature.

CASE REPORT

My own case was in a boy of five years, seen first in October, 1928. He gave a history of a congenital tumour of the neck which, on account of its size, caused some discomfort during infancy but at the time of examination was producing no clinical manifestations. The mother said there was slight wheezing from birth until the child reached three years of age. There was some inconvenience and gulping while nursing, but at

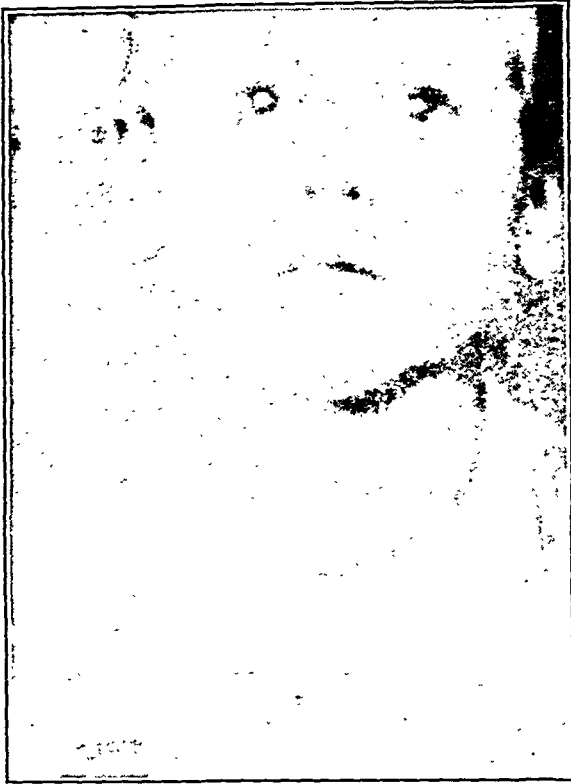


FIG. 1



FIG. 2

present there is no difficulty in swallowing. The family history was negative. The birth was normal and the physical development had progressed satisfactorily, the patient being a well developed, bright and handsome boy. The voice was clear and had never been husky. The laryngoscopic examination was negative.

The tumour of the neck was an irregular one in the region of the thyroid gland. It measured $3\frac{1}{4} \times 2 \times 1\frac{3}{4}$ inches and extended across the middle line on both sides. It was more prominent on the left side but extended well over the right side below. It felt like a hard cartilaginous irregular mass of tissue which was freely movable. The upper level of the tumour was at the upper border of the thyroid cartilage. The mass could almost be picked up from the surrounding structures, but it was impossible to make out definitely that it was not attached posteriorly to the thyroid cartilage. The x-ray report was as follows: "Clinically, this patient has a hard, irregular tumour in the neck. Films were taken to show neck and thorax. The thorax is negative; the bones are normal; the thymus is not enlarged. The trachea is straight except for outlines of soft tissue tumour. No deposits or anything pathological could be made out."

The photographs give a very good idea of the size and character of the tumour.

We advised an exploratory operation with removal of the tumour. The parents, on account of the child's good health and absence of disability, decided to delay operation, as we could not assure them that the tumour did not extend into the deep tissues of the neck. From the general development of the child one can assume that the thyroid gland is functioning normally. At the date of presenting this paper the child was in good health.

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Silica or quartz dust will aggravate tuberculosis of the lungs more than any other known dust, Dr. Leroy U. Gardner, of the Saranac Lake Laboratories, reported to the National Tuberculosis Association meeting. The great hardness of the silica dust is responsible for its greater aggravating effect. Silica or quartz dust is harder even than the dust from granite or carborundum. The mechanical stimulus of these hard particles causes changes in the cells and eventually restores an environ-

ment favourable to the growth of bacteria. Inhalation of the quartz dust affects the disease even when it is in an advanced stage of healing. It appears to encourage the growth of tubercle bacilli and creates conditions favourable to their spread. Experiments with coal dust failed to produce any aggravation of the disease, so that the effect is directly due to the silica dust and not to dust itself.—*Science*, May 31, 1929.

Case Reports

A CASE OF CHORION-EPITHELIOMA IN THE MALE

By D'ARCY PRENDERGAST, B.A., M.B.,
M.R.C.P. (LOND.),

Toronto

The chorion-epithelioma is a tumour which occurs in women in relation to pregnancy. It arises from chorionic tissue in the uterus, and, while far from common, is not very rare. This tumour may, however, occasionally arise from a teratoma occurring in either sex and in any part of the body. What particular tissue in the teratoma is responsible for it is still a matter of some discussion. The testicle is the most common site for teratomata in the male, and as might be expected is also the most common place for chorion-epithelioma in the male. The occurrence of this type of new growth in the male is exceedingly rare. The first case was recognized and reported in 1902, and up to April of the present year there is a total of only 118 cases on record.

That the relation of chorion-epithelioma in the male to the similar growth in the female is neither superficial nor accidental is shown by the fact that in three male cases there was activity of the breasts with secretion of colostrum. This indicates what a wide influence on the general body metabolism may be exercised by teratomatous tissues. In this connection Handfield-Jones suggests the interesting thought that a teratoma might conceivably conceal enough thyroid tissue to cause clinical hyperthyroidism.

Chorion-epithelioma in the male has rarely if ever been recognized during life. On account of the peculiarly invasive characteristics of this tumour metastasis is usually early. As in the case of all testicular malignant growths, secondaries occur in the retroperitoneal lymph-nodes and the lungs, and somewhat less frequently in the liver and kidneys. The sites of these metastases unfortunately are all difficult of surgical approach so that treatment is palliative at best.

The case here reported is of interest not only

on account of its rarity, but also because of the puzzling clinical picture it presented. The testicles were neither enlarged nor the cause of any symptoms, so they were, unfortunately, not particularly examined. It may, of course, very well be that the origin of the tumour was in some part of the body other than the testicle. In two cases on record chorion-epithelioma occurred in teratomata in such an unusual situation as the pineal gland.

History.—The patient was a Pole, 30 years of age. His complaint was nausea and abdominal pain of ten days' duration. He had been perfectly well previously, apart from a slight loss of appetite for four months. Language difficulties prevented the obtaining of a detailed history.

Examination.—The patient was of a sallow colour, seemed to be in pain, and was obviously acutely ill. The liver was tender and large, reaching to the umbilicus. It was possible to palpate several rounded elevations on the surface. A firm oblong mass, about 2 inches by 4, was felt deep in the abdomen in the right lower quadrant. It did not seem to be connected to the liver and did not move on respiration. There was no jaundice. The white cell count was 14,000 per c.mm., with 85 per cent polymorphonuclears. The temperature was of the septic type, reaching 102 degrees at night and becoming almost normal by morning. No other abnormalities were found on physical examination.

A diagnosis was made of pylephlebitis and liver abscess, in spite of the absence of an apparent origin for such a condition.

Stereoscopic plates were made of the chest, with the very surprising result that groups of small circular densities were found in both lung bases. These were diagnosed by the radiologist, Dr. Shannon, as secondary new growth.

The patient's condition became rapidly worse. A mild jaundice developed, with a Van den Bergh reading of 2.8 units. At frequent intervals he vomited dark brown fluid and on one or two occasions actual blood. He died seven days after admission, within three weeks

of the time from which he dated his first symptoms.

Autopsy.—Permission was obtained for a small abdominal incision only. The liver was very much enlarged. Most of its substance was replaced by large nodules of dark red friable tumour mass, containing much extravasated blood. In the cæcal region was a mass of similar nature about the size of a small orange. It had invaded the lumen of both the sigmoid colon and cæcum, and was densely adherent to the retroperitoneal tissues in that neighbourhood. The lung bases both contained smaller nodules of similar tumour mass. The stomach, kidneys, and spleen showed no gross change. No signs of teratoma were found.

Microscopic examination showed the unmistakable histological picture of chorion-epithelioma, with the two characteristic cell-types of the chorionic villus, the small polygonal cells representing the layer of Langhans, and the large syncytial masses.

A CASE OF PARKINSONIAN RIGIDITY TREATED WITH STRAMONIUM

By ROSS ROBERTSON, M.B.,

Wellington, Ont.

In the January issue of *Abstracts of Current Public Health Literature*, I read with interest of the treatment of Parkinsonism with stramonium. Shortly afterwards a patient presented himself with the typical Parkinsonian syndrome, except that the "lead pipe" rigidity was entirely confined to the right side.

History.—He gave a history of having had perfect health previous to an attack of "influenza" six years ago. The patient states that during this attack he was unconscious for two successive nights. His convalescence was rapid and he noticed no impairment for about two years, when his movements gradually became slow and difficult, especially in his right arm and leg. During the next four years his right arm became practically useless so that he took from two to three minutes to write his name and required assistance in eating and dressing.

Physical Examination.—When examined he walked very slowly, with his right leg dragging, and sat down or rose from a chair with painful

deliberation. There was an external squint of the right eye and frequent spasmodic twitchings of the eyelid. He complained of double vision. His expression was "mask like" and his speech was slow and halting. There was excessive salivation with drooling. His mentality was normal, except that he was absent-minded. There was marked lead-pipe rigidity of the right arm and leg, a coarse tremor of both hands, and all reflexes were exaggerated. The patient weighed 155 lbs. and was 29 years old.

Treatment.—He was started on one grain of powdered stramonium leaves (U.S.P.) three times a day, dispensed in capsules. The dose was increased by one grain each day until he was taking two grains every hour (8 times). He had been on this dose but two days when the squint and rigidity entirely disappeared, so that he could walk quite rapidly and use his right hand for writing, eating, cranking a car, etc. The tremor remained the same. However, after a few days he began to complain of blurred vision, dry mouth, diarrhoea, and incontinence. His pulse was running about 120. The dose was reduced to three grains three times a day. The above toxic symptoms disappeared in forty-eight hours, but the rigidity, etc., began to re-appear and the dose was increased by one grain every three days, until a dose of three grains every three hours (5 times) was attained. This dose has been continued without any further symptoms of poisoning and the patient has remained well, being able to do light work and drive a car without difficulty. If he forgets to take two or three doses his movements immediately begin to slow up, but otherwise there has been no decrease in the action of the drug.

A CASE OF AMYOTONIA CONGENITA

By R. ROY MACGREGOR, M.D.,

Kingston

This disease was first described by Oppenheim in 1900, and the majority of the cases reported are of congenital origin, although a small percentage have been described as coming on quite suddenly after certain illnesses such as measles.

The morbid influences which are active in intra-uterine life to produce this condition still remain a mystery to medical science. The con-

dition is believed by most observers to represent rather a failure of certain nervous and muscular developments than a degeneration, although the changes noted pathologically in the nervous system and muscles suggest an atrophy secondary to spinal change.

Greenfield and Stern* describe the pathology of the condition as follows:—

“To the naked eye the only change visible is the atrophy of the anterior roots of the spinal canal and the paleness and smallness of the muscles. Changes under the microscope are degeneration and reduction in the number of the ventral horn cells of the spinal cord, atrophy of the ventral roots, thinness of the peripheral nerves and atrophic changes in the muscles. There is demyelination of many of the fibres of the ventral roots and the number of thin poorly myelinated fibres in the peripheral nerves is usually conspicuous.”

The clinical picture of this disorder, usually observed from birth, is characterized by a symmetrical atrophy and flaccidity of the muscles of the body, which are extremely weak without paralysis. This weakness and atrophy is most pronounced in the limbs and to a less degree in the trunk and face. Mentality and sensibility are unimpaired and the deep reflexes are lost. From reports of cases reviewed the tendency to improve is much less than the textbooks would lead us to believe. One observer of long experience states that he has seen little improvement and no recoveries from this disorder. The severe cases usually die from pulmonary disease early in life, on account of intercostal muscular weakness. Mild cases may be confused with the muscular weakness of rachitis, but in time this condition becomes clearly defined by its lack of improvement under treatment, and may persist into adult life with slight or no improvement.

A mother brought a baby aged four months to my office, complaining that the baby had very little power of movement in its limbs. It was the second child of a family of two children; the first child was alive and well; parents alive and well, and of French-Canadian descent.

The mother said that, although the child had always nursed well at the breast and had grown well, the limbs and back of the child had been very weak from birth.

Examination.—A female child, of four months, in apparently a good state of nutrition; its weight was 14 lb. 6 oz.; the circumference of the head was 15 inches. The child lay in any position in which he was placed, in a limp, lifeless manner. Very weak muscular movements were noticeable in the arms and fingers, but none in the lower limbs. The muscles of the body were unusually soft to the touch and seemed to be wholly lacking in tone. The knee-jerks could not be obtained. No impairment of cutaneous sensibility could be discovered. No atrophy of the musculature was apparent, except that the neck appeared to be smaller than normal in circumference. There was considerable retraction of the chest wall with each respiration, due apparently to intercostal weakness. A slight depression deformity of the ribs was apparent. The muscular movements of the face did not seem to be impaired, and nursing at the breast was accomplished with normal vigour. The infant was unable to hold up its head, and when put into a sitting posture and support was withdrawn crumpled up into a helpless flaccid posture. The limbs of the body could be placed with ease into contortionistic positions. With the child in the sitting position the body could be doubled forward, after the manner of a jack-knife, until the face was between the feet, and the feet could be extended to right angles with the legs.

Three months later the baby was brought into hospital with bronchitis. There had been some improvement in the movements of the upper limbs. The retraction depression of the chest seemed to be more marked. There had been a gain in weight of three pounds. It would be expected that broncho-pneumonia and death should supervene in such a case as this, but recovery took place in a week's time, in spite of the fact that the infant possessed insufficient power to clear mucus from the throat and bronchial tubes by coughing, and the intercostal muscles were obviously very weak.

* Greenfield and Stern, *Brain* 1: 652, 1927.

Editorial

THE ANNUAL MEETING IN MONTREAL

AT any scientific meeting, the actual program is naturally and properly the most important item. Inasmuch, however, as the majority of the papers presented at the recent annual meeting of The Canadian Medical Association in Montreal will, in due course, appear in the *Journal*, the profession may be left to judge for themselves, the exceptional excellence of the whole program.

In industrial life we often see a by-product rivalling in importance the main line of production. To many of those who were fortunately able to attend the Montreal meeting, the thoughtful appraisal of these secondary products seems well worth while.

Glancing over the scientific program we find England and the United States, France and Italy all efficiently represented by gifted and talented workers. The Canadian Medical Association was Confederation's twin and as Canada is to-day growing to national status in world politics, so, too, is our Medical Association assuming its proper place in the international world of medical progress. Our welcome visitors were at once a recognition of accomplishment and a splendid stimulus and encouragement for the future.

The Council of the Canadian Medical Association consists of 138 members. That the profession at large appreciates very clearly the importance of the Association to them individually and to the profession as a whole, that they are beginning to realize what organization in Canadian medicine means, that they value this and are supporting these ideals was clearly shown by the fact that over 100 duly accredited members of the Council were present for the business sessions.

Important announcements of very far-reaching significance were made regarding periodic health insurance; the holding in Canada of the primary examinations for the Fellowship of The Royal College of Surgeons; and the establishing of a Royal College of Physicians and Surgeons of Canada.

There was a very interesting and encouraging enthusiasm amongst those who were attending Council sessions for the first time

and the hope is here expressed that these men will be given an opportunity at the earliest moment to present to their local associations, a résumé of the program presented for their consideration at the Council sessions.

The Hobbies Exhibit deserves special mention. The happy choice of a room so near to the general Convention Hall was rewarded by a large and continuous attendance. The Exhibit—the second to be held, the first having been at the Toronto Meeting in 1927—was varied and stimulating. It was a revelation to all to find how many gifted and versatile members there are in the Canadian profession. These men, active though they are in the many details of medical practice, still find time to round out their lives and attain outstanding excellence in painting and wood carving; in historical writing and sculpture; in music and in photography; in etching and philately; in radio and horticulture. The hope was expressed on every side that this would be an annual exhibit.

It is difficult to restrain one's enthusiasm when speaking of the Association's infant child—the Historical Section. Through the gracious courtesy of The Hotel Dieu, The Montreal General Hospital, McGill University and the St. Sulpice Library, an exhibition of unusual character and great historical interest was presented in such an admirable manner that it is doubtful if anyone who even visited one of the exhibits will ever quite forget the charm and spell of that past which is so vital a part of our present every day life.

And what of the oldest child of Canadian Medicine and of Confederation—the Bonne Entente—the rapprochement between French and British medicine in Canada? It, too, has grown in stature and in promise. Slow of growth, it has been nurtured and guided by the thoughtful members of all the races that blend in making Canada a nation. This meeting might be taken as recognition of the coming of age of the Bonne Entente so eloquently sponsored by Dr. Bazin and

Dr. Primrose, and by Dr. B. G. Bourgeois, President of The Province of Quebec Medical Association. It is to-day the heir apparent of Canadian medicine—Canadian medicine that is distinctive and that will be a definite entity in the medical world because it has the traditions of French and British medicine behind it.

No visitor can look back on the Montreal meeting without wishing for the opportunity to personally thank the citizens of that city—French and English—for their gracious, courteous and generous hospitality. Montreal gave us whole-heartedly of its best and Medical Canada will not forget.

H. H. MURPHY

THEORIES ABOUT THE FORMATION OF GALL STONES

THE formation of gall stones is a rather fascinating study and much experimental work has been done with the idea of establishing an adequate explanation for the occurrence of these remarkable and troublesome concretions. When all is said and done, however, the unbiased student of the literature is likely to come to the conclusion that the last word has not been said. In fact, while recent workers, in the light of what has been discovered in regard to the origin and disposition of that widely disseminated substance cholesterol, have greatly discounted the dicta originally laid down by Naunyn, yet they have by no means attained unanimity among themselves. One may be excused if at the present time one assumes an attitude of incredulity.

Naunyn, in 1892*, stated that the only cause of biliary calculosis that could be positively established was bile-stasis, but, at the same time, he admitted that this factor was not in itself sufficient to account for those cases where gall stones were present within the gall-bladder in great numbers. He, therefore, considered a second factor to be an ascending infection of the biliary passages with *B. coli*, derived from the intestine. The mechanism in brief was as follows. The infective agent set up a catarrhal inflammation of the mucous membrane of the gall-bladder, and as a result of this cholesterol in large amount, and also calcium salts, were excreted by the inflamed mucosa. Desquamated mucosal cells and precipitated bile-pigment or calcium formed a nucleus about which the stone could form. In favour of this view is the fact that Chiari found *B. typhosus* and *B. coli* in the centre of certain gall stones, and the additional fact

that, experimentally, the growth of *B. coli* in bile causes a granular precipitation. Later investigations, also, established that in the presence of protein crystalline materials, like cholesterol, were laid down, not a regular crystals but as truncated plates. All this was accepted teaching until twenty years ago.

Then, Aschoff and Bacmeister*, in the light of later work in bacteriology and metabolism, were enabled to throw new light on the problem, as a result of which Naunyn's theory had to be considerably modified. The main thesis, as set forth by Aschoff and Bacmeister, is that microbic infection is not necessary for the formation of all gall stones, and that, in consequence, gall stones come under two categories, one of inflammatory and the other of non-inflammatory origin. In the latter category are the pure cholesterol and the bilirubin-calcium stones. Notwithstanding the great authority of these two observers, it seems fairly open to doubt that, assuming it to be a fact that stones may result from metabolic disturbances without the activities of bacteria, stones could exist for long without exciting an inflammatory reaction on the part of the biliary passages. Swelling of the mucosa, desquamation of cells, excess of mucin, all would tend to promote biliary stasis, and biliary stasis means infection. Aschoff and Bacmeister's classification appears to us to be too academic. Nevertheless, the newer work on cholesterol metabolism has to be reckoned with.

Cholesterol is a constituent of all cells, and, probably, in the final analysis is derived from the food. When cells disintegrate cholesterol is liberated, but this substance

* Naunyn, B., Klinik der Cholelithiasis, 1892.

* Aschoff, L., and Bacmeister, A., Die Cholelithiasis. 1909.

need not be excreted as a waste product. Most of it can be utilized over again in the building up of new cells. Much, doubtless, is excreted by way of the bile, but some of this is re-absorbed from the intestine. There is, also, evidence that the body can synthesize cholesterol, since on various diets the output is found to be greater than the intake. In the blood stream about four-fifths of the cholesterol circulates as esters of higher fatty acids, the remaining fifth being free cholesterol. In the bile almost all of the cholesterol is in the free state, so that one function of the liver is to de-ester the cholesterol-esters. Certain observers, particularly of the Russian school, notably, Anitschkow and Chalaton*, have shown that the cholesterol content of the blood can be greatly increased by feeding cholesterol. Cell katabolism and peculiarities of diet may, then, account for considerable amounts of cholesterol not only in the blood but in the bile. Naunyn's hypothesis that the cholesterol of the bile is a secretion from the epithelium of the gall bladder seems, as a result of all this, to be discounted, yet it cannot blithely be discarded. Is the cholesterol of the gall-bladder bile an excretion from the mucosal cells, a product of disintegration, or is it the result of the concentrating powers of the gall-bladder? Aschoff thinks the latter.

The cholesterol content of the blood is increased in a number of conditions, such as pregnancy, general adiposity, diabetes mellitus, and chronic interstitial nephritis, and it is well known that gall stones are more common in these circumstances.

On the other hand, Naunyn and Kretz have found it impossible to precipitate cholesterol in sterile bile, and Kuru, in studying cholesterol stones found in them a thin capsular layer of fibrin, which he was inclined to regard as a result of inflammation.

* Anitschkow and Chalaton, Beitr. z. path. Anat. med. z. allg. Path. 56: 379, 1913.

Stasis undoubtedly favours infection, infection favours cell disintegration, and cell disintegration means increased liberation of cholesterol. Add to this a diet rich in cholesterol, or certain errors in the metabolism of cholesterol, and we have the chief factors in the formation of gall stones.

Within the last few years considerable difference of opinion has arisen as to the functions of the gall-bladder. The commonly accepted view is that the gall-bladder is a reservoir which has the power of supplying concentrated bile to the intestine whenever such is required. A quite recent view is that the bile enters the gall-bladder not to be stored there and expelled on occasion but to be resorbed *in toto* by the mucosa of the gall-bladder. Important biliary constituents are thus restored to the blood. Also, the gall-bladder acts as a sort of pressure tank to regulate the pressure within the biliary system while the sphincter of the ductus choledochus is closed. A chief exponent of this view is Bela Halpert,* whose experiments lead him to believe that when the bile leaves the gall-bladder through the cystic duct this is the exception rather than rule. It must be said, however, that the available evidence, obtained from animal experimentation, x-ray examination, and the experience of surgeons, points strongly to the older view. Professor Babkin and Dr. Webster,† in a recent contribution to this *Journal*, strongly controvert this idea of Halpert's. Certainly, were Halpert correct, one would expect gall stones to be more common than they are. More light is needed on the whole matter. Naunyn is not yet discredited.

A. G. N

* Halpert, B., and Hanke, M. T., *Am. J. Physio.* 88: 351, March 1929.

† Babkin, B., and Webster, D. R., *Canad. M. Ass. J.* 2: 32, July 1929.

THE EFFECTS OF SMALL AMOUNTS OF CARBON MONOXIDE ON THE HUMAN ORGANISM

ACCOUNTS of fatalities, either accidental or suicidal, from poisoning by carbon monoxide appear almost daily in the newspapers and there is, in consequence, considerable public interest in the matter. But what is perhaps of even greater importance is the question of moderate intoxication of thousands of garage workers and traffic policemen who are daily exposed to small concentrations of the gas. Several studies, notably those of Bloomfield and Isbell* and Connolly, Martinek and Aeberly† have shown that whereas the hazard to pedestrians is not very great at the present time, the hazard to policemen and particularly to garage workers is very real. In the case of garage workers fatalities are not very common, to be sure, but the fact of their exposure to varying concentrations of carbon monoxide raises the question as to whether permanent effects are to be anticipated. A recent publication of the United States Public Health Service‡ throws some light upon this.

Six students from the University of Pittsburgh volunteered for an experiment which was designed to show the effects on them of small concentrations of carbon monoxide from the exhaust of a gasoline engine. The students were exposed from four to seven hours a day for sixty-eight days to concentrations of 2, 3 and 4 parts of gas to 10,000 parts of air. Control experiments were also conducted, in which no exhaust gas at all was used, or in which exhaust gas with a negligible amount of carbon monoxide was used. If it be remembered that carbon monoxide has a hæmoglobin combining power nearly three hundred times that of oxygen it will be seen that 2, 3 and 4 parts of carbon monoxide per 10,000 parts of air are equivalent to 600, 900 and 1200 parts per 10,000 of oxygen, with respect to its ability to combine with

hæmoglobin. The oxygen percentage in the air is about 20, or 2000 parts per 10,000. On theoretical grounds, a carbon monoxide concentration of 7 per 10,000 would be equivalent, so far as its hæmoglobin-combining power is concerned, to 2100 parts per 10,000 of oxygen, and in the case of an individual exposed to such concentrations, we would expect his blood to become 50 per cent saturated after a state of equilibrium had been reached. The Pittsburgh investigators found that when the students were exposed to a concentration of 2 parts of carbon monoxide per 10,000 of air their blood became 25 per cent saturated in about five hours; exposure to 3 parts per 10,000 resulted in 30 per cent saturation in about five hours; and exposure to 4 parts per 10,000 resulted in 35 per cent saturation in five hours. It took from four to five hours for equilibrium to be established.

Headache was, perhaps, the most characteristic symptom of early intoxication. Frontal headache usually occurred when the blood became 18 to 20 per cent saturated; occipital headache and dizziness very often developed when the percentage saturation rose to 30. It is generally held that carbon monoxide exercises its toxic effects by virtue of its affinity for hæmoglobin. It is not a tissue poison; it is not even a poison for the red blood cell; for once the red cell is free from carbon monoxide it is just as efficient as it ever was. According to the modern view the disability from which an individual poisoned with carbon monoxide suffers is due, therefore, to the temporary anæmia and to nothing else. Just why headache should be a prominent symptom is not quite clear. An individual with his blood 30 per cent saturated with carbon monoxide has 70 per cent of his hæmoglobin available for carrying oxygen. Certainly headache is not a prominent symptom of moderate anæmia. It has been suggested that other gases present in the exhaust of gasoline engines may be responsible for some of the symptoms of exhaust gas poisoning. The investigations in Pittsburgh indicate that this is not so, for the subjects were exposed to the exhaust gas

* The Problem of Automobile Exhaust Gas in Streets and Repair Shops of Large Cities, Public Health Reports, March 30, 1928.

† The Carbon Monoxide Hazard in City Streets, *J. Am. Pub. Health Ass.*, November 1928.

‡ Effect of Repeated Daily Exposure of Several Hours to Small Amounts of Automobile Exhaust Gas, *Pub. Health Bull.*, No. 186, U.S. Public Health Service, Washington, D.C.

of a gasoline engine in which the carbon monoxide had been reduced to a negligible amount, and in this case there was no increase in the number of headaches among the students, and none developed occipital headaches.

During the sixty-eight days of the Pittsburgh experiment there was no apparent deterioration in the health of the students, as judged by weight, appetite, and physical strength. An interesting observation was the fact that in five of the six students the percentage of hæmoglobin increased very definitely. Most of the students showed an increase in the red cell count as well. It is a matter for speculation whether the increase would have continued, or would have been sustained even if the experiment had proceeded for a year, but this observation bears out the impression of many that continued exposure to small amounts of carbon monoxide does result in a mild polycythæmia. It constitutes, in fact, about the only evidence we have that there is such a thing as chronic carbon monoxide poisoning.

Psychological tests of steadiness, memory, co-ordination, and arithmetic were also carried out during this experiment, but these showed no significant change. This is probably a criticism of the tests, however, since it is reasonable to suppose that in the presence of dizziness and headache the subject's mental ability would be somewhat impaired. There does not appear to be at this time any reliable test for measuring quantitatively the increase or decrease of an individual's ability to do mental work.

In general, the experiment showed that, with the exception of the alteration in the hæmoglobin and the number of red blood cells, no demonstrable change occurred in the six students. Whether the blood changes

are significant remains to be seen. Sixty-eight days is a long period in which to conduct such a study, but compared with actual practice it is very short. Furthermore, the concentrations of the gas used were lower than occur in some garages. Other observations have shown that the concentrations of carbon monoxide may be as high as 11 parts per 10,000 in certain garages. This, incidentally, is probably actually lethal if breathed for four or five hours. Whether a chronic impairment in physique occurs or not remains to be demonstrated, but certainly it is hardly justifiable to allow men to work under conditions which inevitably produce malaise and discomfort.

In streets the evidence at hand is to the effect that no important hazard exists at present. With the increasing use of automobiles and particularly if the proposed "double deck" street comes into use, the problem may become pressing. The proposal made some years ago by Yandell Henderson, that the exhaust pipes of automobiles be continued upwards to the top of cars is worthy of consideration. In garages adequate ventilation appears to be the solution. This may be accomplished locally or generally. The installation of local exhausts at suitable places to be attached to the exhaust pipes of motor cars while the engine is running is undoubtedly the best means. General ventilation by means of blowers and exhausts, whereby the air of the place is changed from six to ten times an hour, is valuable and is the method adopted in vehicular tunnels. There is no real evidence that ozonizers are of any practical value in oxidizing carbon monoxide to carbon dioxide.

FRANK G. PEDLEY

Editorial Comments

AN EPIZOOTIC AMONG RODENTS IN SOUTH AFRICA

It is gradually becoming borne in upon us that the rodent is of more importance to the human race than his small size and relative insignificance would suggest. The rôle of the rat and the ground squirrel in connection with the perpetuation and spread of plague, has been, of course, well known for years; and the part played by the rabbit in connection with tularæmia is just now becoming appreciated.

Recent studies have been made in the De Aar region of South Africa of a very fatal epizootic that has been devastating a small veld rodent known as the Namaqua gerbille (*Desmodillus auricularis*). The appearance of the malady in these small animals was strongly suggestive of plague, and it came somewhat as a surprise to the laboratory workers to find that this was not the actual form of infection. The anxiety at first felt was increased for the reason that there were, during the same period, two cases of undoubted bubonic plague in human beings. Eventually it was discovered that the organism at work was a member of the *Pasteurella* group. It is possibly a new species, and, if this proves to be the case, the name *Pasteurella desmodilli* has been proposed for it.

With the occurrence of a few additional cases of true plague in human beings there has been considerable ground for worry. However, the destruction of the gerbille in such large numbers must, for a time at least, lessen greatly the pos-

sibility of the true plague becoming epidemic and getting out of hand.

A.G.N.

SCIENCE, RELIGION, AND STAINED GLASS

Stained glass windows in churches usually depict incidents in the Sacred Story, or the imaginary persons of the Saints. To a large extent they are conventionalized in design. Since the Great War, soldiers, sailors, and flags, more or less idealized, have also appeared in windows. Here the sentiment is also on an elevated plane. Occasionally, a coloured window is allegorical in subject, as in the case of one in Southwark Cathedral, London, which depicts Shakespeare's Seven Ages of Man.

It is but rarely that more prosaic, everyday subjects are translated into stained glass. Probably the only instance of this to be found in England is in the Church of Stoke Poges, the churchyard of which was the inspiration of Gray's *Elegy*, where in one of the small windows is the representation of a somewhat archaic-looking bicycle. Now, we learn that four stained glass windows have been placed in the Third Unitarian Church, Chicago, symbolic of Science, Industry, Art and Education, and suggesting that religion is the integration of all life. In the window representing science we see a microscope and a retort, a frank recognition of the fact that religion must realize the implications of the scientific world-view.

A.G.N.

Special Articles

THE PREVENTION OF FILM FIRES

By HARVEY AGNEW, M.D.

Department of Hospital Service.

PART I

Few disasters have stirred the pulse of the world and set everyone to serious thought to the same degree as has the recent unfortunate experience of our confrères in Cleveland. Other catastrophies have caused greater loss of life and property damage, or covered much greater territory, but the thought-provoking factor which has stirred us so profoundly in this instance is the alarming reflection that the next prey to this demon may be our own hospital with its precious charge of helpless inmates.

That this fear is not without foundation can be accepted in a great many Canadian communities. The fire hazard in many of our hospitals is exceedingly high. While visiting our

hospitals in various parts of Canada the writer has seen many examples of improperly protected x-ray departments. Frequently located in the basement of old or non-fireproof buildings, with films stored on wooden shelves in unventilated chambers, with improvised electrical wiring and with cigarette smoking a common occurrence, these departments constitute all too often a distinct fire menace. The daily handling of nitro films without accident is very liable to make even the most careful forget that they are handling a medium that is really gun-cotton.

In a recent hospital fire study¹ the astounding facts were revealed that one hospital fire in every four results in total destruction and that eight people die on the average in each institutional fire! It has been calculated that one hospital a day is the sacrifice contributed by Canada and the United States to this Minotaur.²

Many false rumors concerning the origin of the Cleveland fire were freely circulated, but the

essential features are contained in the following excerpts from the official report of the National Fire Protection Association:

THE COAL ROOM

"The room which had been designed as a coal bin had been converted for storage. It was a brick enclosure 19 x 24½ feet, a little over 9 feet high, and without windows. The pipe tunnel extending around the basement opened directly into a corner of this room. Nitrocellulose x-ray film, size 14 x 17 inches, in paper envelopes, was stored in this room, mostly on wooden shelves, but some in steel filing cases. Estimates place the amount present between 3 and 4 tons. In spite of this tremendous quantity, the room was not sprinklered nor were vents to the outside provided. A disused coal chute which might have acted as a vent was closed on the outside by a heavy iron door cover and by a wooden shutter on the inside. A doorway connecting with the heater room was equipped with a fire door.

Lighting was by ordinary electric bulbs on pendant cords. A 4-inch steam line bringing steam, at a reported pressure of from 45 to 65 pounds per square inch, from the near-by hospital passed overhead through the coal room. This pipe was about a foot above the film storage shelves and a vertical section passed within a few inches of the shelves. Where this and several other pipes passed through the walls, holes had been subsequently bricked up around the pipes.

WHAT HAPPENED

On Wednesday morning, May 15th, a steam-fitter arrived at the Clinic to repair a leak reported in a steam pipe in the film storage room. At 8.45 a.m. he entered the room and, hearing steam escaping, proceeded to unwrap the magnesia covering from a 4-inch main steam supply pipe to locate the leak. This pipe is said to be the one located directly over or near the film storage racks. The steamfitter could find no leak, but the room was said to be extremely hot.

Two hours later he returned on a second call and found the room filled with steam. He went to the hospital building to have the steam supply shut off. This the engineer did. Twenty minutes later, or at about 11.15 a.m., when the steamfitter returned again, he heard a 'sputtering hiss' and saw a cloud of yellow smoke 4 or 5 feet in diameter at the ceiling of the film room. Obtaining a 2½-gallon soda and acid type extinguisher near by, he directed the stream with no apparent effect at what he supposed was a fire. Fumes poured forth faster and faster. Being nearly overcome and having exhausted the extinguisher, he had just reached the door of the film room when an explosion occurred. The fire door remained open. He managed to reach a window and was blown through it by a second explosion.

HOW THE FIRE STARTED

It is obvious that the fire came from the decomposition of the nitrocellulose film. Pyroxylin compounds like nitrocellulose film are chemically unstable at elevated temperatures and decompose at temperatures as low as 300° F. This decomposition generates further heat and liberates carbon monoxide, various oxides of nitrogen and other gases which are both poisonous and highly explosive. Exactly how the decomposition was induced is not yet definitely known. The following are possibilities arranged roughly in the order of their probability.

(a) *Electric Light Bulb.*—About where the steamfitter was working was a pendant bulb said to be 100 watts capacity. The cord was draped around a disused steam main, and the bulb hung just above the top of a shelf used for film storage. Had there been several envelopes of film on this shelf the bulb would have been resting directly on the film. Enough heat would thus have been available to start decomposition of the film. A bulb on an extension cord was provided and habitually

used by the x-ray technician who filed the films. This bulb may have been used by the steamfitter and left in contact with some of the films.

(b) *Steam Pipe.*—Although there was no leak found, there was certainly steam escaping, and a jet impinging on a film may have induced decomposition. The heat from the steam pipes, which with steam at 65 pounds pressure would have been at about 312°F., would have been ample to start the decomposition. The steam pipe passed so close to the film storage shelves at one point that a bare fitting was within a few inches.

(c) *Matches or Smoking.*—The newspapers reported that an inspection agency had found a package of cigarettes in the coal room a few weeks before the fire. A discarded match, cigarette or tobacco ash is at least a possible source of ignition.

Ignition of the gases, causing the several explosions, may have resulted from the heat generated by the decomposition of the film. There was an automatic gas water heater just outside the room in the basement, the pilot light of which is believed to have been lighted, and which is a possible source of ignition.

THE LOSS OF LIFE

The deadly fumes, forced through the pipe openings to every part of the building, caught many persons unaware. Several doctors and nurses collapsed at their desks. Others, aware of the gases at first by their irritating odors, gasped and collapsed as they sought air. Others could struggle to a window, a door or to a stairway before their lives were snuffed out. Firemen entering the front stair tower from the roof found 16 bodies strewn at intervals along that stair. Probably half of the persons present died an almost instant death.

While the exact cause of the deaths is uncertain, most of them resulted apparently from the carbon monoxide and nitrogen peroxide from the burning film. Carbon monoxide kills without warning. Nitrogen peroxide tends to form nitric acid in the lungs."

In the Syracuse³ fire, while no definite cause was discovered, two steam pipes passing through the closet were thought to be responsible for the decomposition. Escaping steam from an underground steam pipe outside of the building wall caused the spontaneous fire in a recent Detroit hospital fire. In the Albany⁴ x-ray fire of unknown origin, eight deaths occurred in the 48 hours subsequent to the fire, although "these were not all caused by the fire." It is worthy of note that in none of the previous fires did the gassing affect the patients so seriously. This may be due to the vagaries and complexities of gas formation under varying conditions, to the concentration and to the unusually rapid dissemination of the fumes under pressure to almost every room through the pipe openings leading to wash basins and medicine cabinets.

THE PREVENTION OF FILM FIRES

Nitrate films are a hazard at all three stages, before exposure, in the current file and when stored for reference.

Unexposed films.—This supply should be the minimum commensurate with the turnover and the time distance from the supply house. Self-closing metal containers preferably ray-proof should be used. Film scrap and waste should be carefully removed.

Current file.—This file should be kept at a minimum and should be so located that, while accessible, it is not exposed to the dangers incidental to the viewing room. This file cannot be relegated to the roof or an outbuilding but should be in a separate room where the most rigid fire precautions can be observed. Shelf construction, ventilation, doors, etc., should be as described below under "Reference File." Where the number of such films is small, instead of a vault, a heat-insulated metal safe vented through the wall to the outside would suffice. Many cabinets are seen in use which are not ventilated at all and one hospital is known to have a heavy steel burglar-proof office safe with six inch walls, a safe which was not only expensive, considering its limited space, but provided no ventilation whatsoever.

Reference File.—Where films are kept for several years, they should be stored, not in the hospital basement, but in a separate structure at least one hundred feet from the hospital proper, or if this be not feasible, as in a crowded city district, then a special vault should be built on the roof. According to the Eastman recommendations,⁵ four basic requirements should be satisfied: (1) The room should be of fire-resistant construction. (2) The room must have a direct outlet to the outer air. (3) There should be a Class B, self-closing fire door at communication to building proper. (4) The room should be additionally protected by automatic sprinkler heads.

The room should be built of brick or concrete. The vent should be open at all times and must not be too small. A circular opening of 13½ inches is sufficient for 1,000 pounds of film. It is considered correct to provide 140 square inches of vent for each 1,000 pounds of film stored; or this area may be calculated by allowing one-half square inch per cubic foot of storage space.⁶ In Germany, the roof vaults have glass windows on two sides which will blow out in case of an explosion, thus ensuring egress of fumes.

Heating should be by hot water. If steam is used, it should not be stored near the radiators, which should be protected. As few hot pipes as possible should be permitted in the room and these should be most carefully insulated. The films in Cleveland were stated to be within 7½ inches of the high pressure steam pipe.

Sprinklers will not only reduce the rate of fire spread, but may save many valuable films, and, by dissolving gases out of the fumes, lessen the danger to inmates. Simple sprinkler heads are not expensive; and can be installed for eight or ten dollars apiece. In twenty-three recent fires in sprinklered hospitals, each fire was extinguished at the beginning by the sprinklers and not a single life was lost.¹

Shelves should be of metal or other fire resisting material and should be partitioned at

frequent intervals. Many roentgenologists prefer to leave them open and slatted to ensure thorough air circulation.

Small hospitals with a very limited collection of films may feel justified in storing them in a metal cabinet in the main building; but these smaller structures are seldom fire proof and an outbuilding, even if only a metal garage, should be erected. Cold does not injure films.

GENERAL PRECAUTIONS

Fire extinguishers should be readily available. If of the acid-soda type, they must be carefully refilled each year and the nozzle kept clear of corrosion. The small glass containers of carbon tetrachloride are very handy and efficacious. It is well to remember that the fire hose so neatly coiled in the corridor wall is frequently so devitalized that the slightest water pressure would burst it in a score of places. Extension electric lights should be forbidden and only safety vapour-proof bulbs should be used. The glass in film illuminators should not get hot to the touch. Films should not be left on display. "No smoking" signs should be prominently displayed and rigidly enforced.

(The "Safety Film" and the resolutions of the recent fire conference at Ottawa will be discussed in the next issue).

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REQUIREMENTS FOR MEDICAL LICENSURE*

By W. H. HATTIE, M.D.,

*Faculty of Medicine, Dalhousie University,
Halifax, N.S.*

The amazing rapidity with which knowledge applicable to medical practice has been and continues to be accumulating makes the task of medical teacher and medical student alike most formidable. The marvellous triumphs of recent years have not only given a tremendous impetus to research but have let loose such a flood of benefactions as to establish research on a quite unprecedented scale. The effect of this on the medical curriculum of the future cannot be clearly foreseen, but we must expect results which will greatly modify present conceptions.

* Conference of Canadian Universities, London, Ont., May 31-June 2, 1927.

Men and Books

THE SO-CALLED SCANZONI MANŒUVRE

BY THOMAS GIBSON, M.B., C.M.

Lecturer on the History of Medicine, Queen's University, Kingston.

I wonder if any of our Canadian obstetricians have noticed that in the letter-press opposite plate No. xxi of Smellie's "Tables," the manœuvre, called in modern text-books Scanzoni's, is described nearly one hundred years before the date of Scanzoni's chief publication of 1852.

Plate xxi is a magnificently engraved presentation of a large fetus, its head coming by the vertex in the left occipito-posterior position, with Smellie's pelvic-curved forceps applied to the sides of the head. On the opposite page are the following words explaining the treatment of such a case: "If the child cannot be delivered by the labour-pains, or turned and brought footling, the forceps are to be applied to the head as it presents; but if that cannot be done without running the risk of tearing the perineum, and even the vagina and rectum of the woman, the forehead must be turned to the sacrum. To do this more effectually, the operator must grasp firmly the handles of the forceps, and at the same time pushing upwards, raise the head as high as possible, in order to turn the forehead to one side, by which it is brought into the natural position; this done, the head may be brought down and delivered as in table xvi."

Note L. "Sometimes the forehead may be moved to the natural position by the assistance of the fingers, or only one blade of the forceps."

Plate xvi shows the application of the forceps to a left occipito-anterior position of a vertex presentation with the head half-way through the bony pelvis. To follow the suggested advice and at the same time act in accordance with the figures in plates xxi and xvi would involve the removal of the curved forceps of plate xxi and the re-application of them as in plate xvi. Is not this, in condensed form, "Scanzoni's manœuvre"?

Plate xxvi is an outline drawing of an arrested mento-posterior case. The text suggests the use of the forceps, applied to the sides of the head so as, by their means, to push up the head as high as possible and then rotate it, to bring the chin towards the front. Rotation is to be aided by the pressure of two fingers applied to the chin of the child.

Case-record No. 258 in Smellie's "Collection" (McClintock's edition, New Sydenham Society, vol. ii, p. 338) describes how he was called, in the year 1745, by a midwife to see a woman who had been in strong labour all night. He found the bregma "at the left groin" and diagnosed a posterior occiput as the cause of the delay.

Putting the patient in the lithotomy position, he applied the forceps to the sides of the head. He first tried to bring about a face delivery by pulling backwards to extend the head as far as possible. This failing, he tried to bring down the occiput, but without result.

"While I paused a little, considering what method I should take, I luckily thought of trying to raise the head with the forceps, and turn the forehead to the left side of the brim of the pelvis where it was widest, an expedient which I immediately executed with greater ease than I expected. I then brought down the vertex to the right ischium, turned it below the pubes, and the forehead into the hollow of the sacrum, and safely delivered the head by pulling it up from the perineum and over the pubes. This method succeeding so well gave me great joy, and was the first hint in consequence of which I deviated from the common method of pulling forcibly along and fixing the forceps at random on the head. My eyes were now opened to a new improvement on the method of using the forceps in this position, as well as in all others when the head presents."

These artless words of Smellie's give us the first recorded correction of an arrested occipito-posterior case by rotation with the forceps. Occurring in the year 1745 this case must have been delivered with Smellie's first short straight forceps, made by him to replace Duse's French model which he had found unsatisfactory. The "English" lock was introduced by Smellie about the year 1744. The pelvic curve was added to the form of the forceps by Levret and Smellie independently, in 1751. Both were probably anticipated by Pugh, and Smellie takes no credit for priority, "they were contrived by himself and other practitioners." Their special use was "to take a better hold of the head when presenting and high up in the pelvis." To meet this emergency still better, the new model was made longer than the first, which measured but eleven and a half inches.

Smellie's "Tables" were published in 1754, and in one of the notes attached to Plate xxi he says the rotation of the posterior occiput may be made with either the straight or the curved forceps. But he also advises that, when the forehead has been turned to the side of the pelvis, the head may be pulled down, "as shown in Table xvi." It is unlikely that an obstetrician so acute as Smellie would fail to observe that it was more convenient to re-apply the curved forceps at a point in the descent when the pelvic curve would be a detriment and not an advantage.

In later discussions as to the merits of the two types of forceps, straight and pelvic-curved, McClintock says (Smellie's Midwifery, vol. i, p. 260): "Its (the straight) application is certainly simpler, and it can more safely follow the rotation of the

head during its descent through the pelvis," and Leishman says (Midwifery, p. 528) "If it be found necessary to alter the position of the head by rotation, this can only be effected by the straight instrument."

I received on May 13th, from Dr. J. Whitridge Williams, of Baltimore, a letter in which the following statement is made: "I have just looked up the matter of the application of the forceps to an obliquely posterior ear in Smellie's Tables and I think you are entirely correct in stating that he antedated Scanzoni by nearly one hundred years. This is extraordinarily interesting, as it shows what a keen observer Smellie was."

J. J. WATERSTON: A MAN BORN OUT OF HIS TIME

J. J. Waterston, born in Edinburgh in 1811 and educated in mathematics and physics under Sir John Leslie, at the age of 21 came up to London to train as a civil engineer. Having qualified, he sought for work that would enable him to follow his hobby—pure science. The post of naval instructor to the East India Company's cadets answered his purpose, "giving him leisure and no anxiety, care, or responsibility, and at the same time enabling him to lay up a little for old age." The rest of his life was devoted mainly to scientific thought. In his first serious adventure—namely, an attempt to express mental phenomena in terms of physical changes—he perceived that the excessive refinement of structural adaptations exhibited by living organisms must depend ultimately on molecular adaptations. To molecules, therefore, he turned his attention, since he felt that, in whatever way the phenomena of nature were examined, molecularity was the grand terminus to which all investigations tended. Thus he was led to the study of molecular physics, and in particular to the physics of gases; and in this branch he exhibited a penetration which marks him out as one of the greatest thinkers of the nineteenth century. He discovered that the physical laws common to all gases and vapours could be brought under one broad generalization on the assumption that a gas consists of molecules travelling with enormous rapidity in every possible direction. A carefully written paper, in which this dynamical theory of gases and of heat and temperature was formulated with great precision and clearness, was sent in to the Royal Society in the year 1845—and rejected. The two referees appointed to examine it pronounced it unworthy of publication, one of them expressing the opinion that it was "nothing but nonsense, unfit even for reading before the Society." In itself the incident may be considered trivial, but its practical effect was permanently to eclipse Waterston's splendid generalization. By the rules of the Society publication of the paper elsewhere was prohibited, and although Water-

ston made some attempts to draw attention to the subject, his efforts were without effect. The discovery was made afresh by other men some fifteen years later, and before the end of the century the dynamical theory had become a commonplace in ordinary textbooks. The incident has a pleasant sequel. A few years after Waterston's death Lord Rayleigh discovered the now celebrated paper in the archives of the Royal Society, and published it in the *Philosophical Transactions* (1892), with a generous appreciation of Waterston's work; and recently Professor J. S. Haldane has edited the collected works,* prefaced by an interesting biography of Waterston, whom he actually ranks highest in the brilliant group of physicists turned out in the early part of the last century by the Scottish universities, including such men as Brewster, Forbes, Thomas Graham, Andrews, Rankine, Kelvin, Clerk Maxwell, Tait, and Balfour Stewart.—*Brit. M. J.*, 1: 614, Mar. 30, 1929.

GOLDSMITH AS A MEDICAL MAN

Goldsmith and his connection with the medical profession was the subject given recently at the medical school of Trinity College, Dublin, by Dr. T. P. G. Kirkpatrick, Honorary Lecturer in the History of Medicine.

The lecturer said that Goldsmith entered Trinity College as a sizar at the age of fifteen, on June 11th, 1745. Both as a child and a school-boy he was said to be dull and stupid, but the fact that at fifteen years of age he had learned enough Greek and Latin to pass the entrance examination to Trinity as a sizar did not lend much support to that view. There were no contemporary records of Goldsmith, such as they had of his contemporary and great compatriot Burke, who, though a fellow student, did not seem to have known him; nor did Goldsmith seem ever to have joined Burke in the debates of the Historical Society. That Goldsmith's life in college was miserable was unlikely from all that was known of his character. He left college with a competent knowledge of the classics, and also with a much wider knowledge of life than was usual for one who had just graduated. A man who had sold his bedclothes to shelter the derelict might well have learned more of the problems of life than the scholar whose polished periods were to procure for him a bishopric. They had not a trace of evidence that Goldsmith had any idea of following the medical profession until shortly before he set out for Edinburgh, in the autumn of 1752; nor, indeed, was there any evidence that he ever returned to Trinity College after he took his degree in 1750. Although Goldsmith had referred to the lecturers and

* *The Collected Scientific Papers of John James Waterston*. Edited, with a biography, by J. S. Haldane, M.D., LL.D., F.R.S. Edinburgh and London: Oliver and Boyd. 1928. (Med. 8vo, pp. lxii + 709; illustrated. 25s. net).

professors in Edinburgh, he never mentioned any medical lecturer in Trinity. There was no evidence that Goldsmith, when he started the study of medicine, did not intend to become a doctor. He attended with considerable regularity lectures in Edinburgh, but it seemed strange that he should have left Edinburgh without taking a degree in medicine. At that time there was no strict curriculum or regulation for candidates seeking medical degrees, since the statute which afterwards governed such matters was not formulated till 1767. It must be remembered, however, that at Edinburgh University it was then the exception rather than the rule for students to proceed to a degree either in arts or medicine. It could not be assumed, the lecturer went on, that Goldsmith did not intend to pursue the practice of medicine because he did not seek a degree in Edinburgh, or that his studies there had not qualified him to do so. From Paris Goldsmith went to Berne, Basle and Geneva, and thence into Northern Italy. The question of where Goldsmith obtained his M.B. degree has been much discussed and investigated; at the Section of the History of Medicine of the Royal Society of Medicine in 1914 it was suggested that he deceived the University of Oxford when, on February 14th, 1769, he got an *ad eundem* degree of M.B. by describing himself as an M.B. of Dublin. Dr. Kirkpatrick, after careful consideration of all the circumstances—among them the fact that medical degrees were sometimes granted by the University of Dublin without examination, as occurred in the case of Richard Brocklesby, also a friend of Dr. Samuel Johnson—suggests, though without dogmatism, the possibility that Goldsmith may have had the M.B. degree of Dublin University conferred upon him *in absentia*. He was reported to have spent some months in Padua, where it was suggested he took a medical degree. For this suggestion there was no evidence, nor was there any that the University of Padua granted the degree of Bachelor of Medicine at all. Having referred to Goldsmith's return from the Continent to England, Dr. Kirkpatrick went on to say that some time subsequently his old friend and fellow student at Edinburgh—Dr. Fanu Sleight—met and assisted him to start in medical practice in a small way at Bankside, in Southwark, and that, writing in reference to this, Goldsmith said: "By a very little practice

and a very little reputation as an author I made a shift to live." The little practice in medicine gave him ample time, however, for writing. Through the acquaintance with Dr. Milner, one of the most interesting episodes in Goldsmith's medical career occurred—his proposed appointment as medical officer in the East India Company at Coromandel, for which he had the more or less definite promise of an appointment at £100 a year, with the prospect of a private practice, that was believed would bring it up to £1,000. After the offer was postponed, the idea was ultimately cancelled by the Surgeons' Hall on the ground that he was not qualified. The cause of this rejection was not recorded. On March 31st, 1763, Goldsmith signed an agreement with James Dodsley, the publisher, to write a book called *A Chronological History of the Lives of Eminent Persons of Great Britain and Ireland*. In this agreement, written in his own hand, and preserved in the British Museum, Goldsmith describes himself as "Oliver Goldsmith, M.B." As far as was known this was the first occasion on which he was recorded as a bachelor in medicine, although it was not uncommon to find him referred to as "Doctor Goldsmith," or described as "Oliver Goldsmith, M.B." It was reasonable to suppose that in describing himself in an official document as "M.B." Goldsmith did so correctly, and that at that time he had, in fact, been granted that degree. The records of many universities had been searched, but in none had there been found any documentary evidence for a degree in medicine granted to Goldsmith. Dr. Kirkpatrick then referred to a subsequent attempt of Goldsmith to supplement his income by medical practice, and how it ended, and he concluded with a description of Goldsmith's death in 1774. There must always be some doubt about the nature of his final illness and his own responsibility for its termination. Against the advice of Drs. Hawes and George Fordyce, he obstinately persisted in dosing himself with Dr. Robert James's fever powder, though Dr. Kirkpatrick believes that neither the powder nor any other treatment employed can be justly blamed, and cautiously suggests that Goldsmith's chief complaint was some form of chronic nephritis, which terminated in uræmia.—*Brit. M. J.*, 1: 469, March 9, 1929; *ibid.* 1: 1049, June 8, 1929.

Four factors responsible for the gratifying decline in the tuberculosis death rate during the last thirty years are the elevated standard of living, improved sanitary control, more adequate hospital facilities and public health education, according to Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, who recently addressed the National Tuberculosis Association. Continuation of the public health and social service activi-

ties responsible for much of the decline will probably further decrease the tuberculosis death rate to a negligible point. The lowest tuberculosis death rate was recorded for the year 1928. The decline since 1900 has been steady and ever-accelerating. Thirty years ago tuberculosis brought death to nearly two and a half times as many persons per 100,000 as now.—*Science*, May 31, 1929.

Association Notes

MESSAGE FROM HIS ROYAL HIGHNESS THE PRINCE OF WALES

Acting upon instructions of Council, at our recent Annual Meeting in Montreal, the following message of greeting was cabled to the Prince of Wales:—

"Canadian Medical Association, in sixtieth annual session assembled at Montreal, desires to extend to Your Royal Highness heartiest birthday greetings."

On June 24th, the following reply was received from the Private Secretary to His Royal Highness:—

"Please convey to members Canadian Medical Association Prince of Wales' sincere thanks for their kind birthday greetings."

GREETINGS FROM CHINA MEDICAL ASSOCIATION

The following message by night-letter was received from Dr. E. R. Cunningham, the chosen

representative of the China Medical Association:

"Greetings and sincerest good wishes for the best annual meeting in history of your Association. Congratulations on continued growth and achievement in scientific medicine. May the friendship between our Associations become channel for mutual understanding and goodwill between China and Canada. Regret inability to communicate greetings in person. On behalf of the China Medical Association."

Later on Dr. Cunningham writes:

"Further, on behalf of the Canadian Members of the China Medical Association, especially for those engaged in the Honan and West China fields of the United Church of Canada—let me voice the appreciation of the gracious act of the Canadian Medical Association in sending the *Canadian Medical Journal* to the respective mission stations where Canadian graduates are at work. We do appreciate the *Journal* and derive much benefit, inspiration and pleasure in the perusal of its pages."

Hospital Service Department Notes

IMPRESSIONS OF THE FIRST INTERNATIONAL HOSPITAL CONGRESS

The first hospital convention on an international basis was held in Atlantic City from June 13th to 15th. The result of two years' assiduous preparation on both sides of the Atlantic, this congress was a definite success and warranted the effort expended. Delegates were present from forty-four countries. They included representatives from South Africa, Australia, New Zealand, Japan, China, Greece, Italy, Hungary, Finland, Poland, Norway, Sweden, Spain, Great Britain, Germany, France, Czecho-Slovakia and nearly all countries of South, Central and North America. Holland sent over a large delegation. The general interest in hospitals now taken everywhere is attested by the fact that the Egyptian Government sent four delegates to this congress, Dr. A. K. Henry, the Professor of Surgery at Cairo, Dr. A. F. El Rasheed Bey, the Public Health Administrator, Mr. Aly Farid, the Director of Works, and Mr. C. R. Bawden, Inspector of the State Buildings Department. The Government is planning a great medical school in Cairo, including a 1,300-bed hospital with an outpatient department having capacity for 3,000 patients per day.

Canadian speakers on the program were Dr. J. J. Heagerty, Chief Executive Assistant, and Mr. Evan Parry, Supervising Architect of the Department of Pensions and National Health, Ottawa; Dr. Geo. F. Stephens, of Winnipeg, Dr. A. K. Haywood of Montreal; and Dr. Harvey Agnew of the Canadian Medical Association. Other Canadians in attendance were Mr. W. R. Chenoweth, of the Royal Victoria Hospital, Montreal; Mr. A. J. Swanson, of the Toronto Western Hospital; Dr. D. M. Robertson, of the Ottawa Civic Hospital; Mr. Henry Rowland, of the Isolation Hospital, Toronto; and Miss Dorothy Dart, of the Ontario Hospital Association.

The language handicap did not prove insurmountable at all, largely because of the admirable efforts of Dr. René Sand, of Belgium, the Chairman. Addresses were delivered in English, French or German and concise translations were then made by Dr. Sand.

It is a matter of regret that more of our members, who are interested in their local hospitals, could not have heard some of the discussions. Dr. S. S. Goldwater, the well-known hospital consultant, deplored the present day tendency to incorporate in new hospitals more features than can be economically utilized. He also warned against too much centralization,

the erection of great medical centres with resultant lack of co-ordination and personal contact, and doubted the value of overstandardization, where it interferes with originality and initiative. Mr. Parry, of Ottawa, struck a responsive note when he longed for a well regulated earthquake every twenty-five years to enable our hospitals to keep pace with the changing types of construction. Dr. A. V. Aviles, of Ecuador, strongly opposed their system of cheap "pay clinics." The doctors are thought to get one-half of the twenty-five cents fee, whereas they actually get nothing. Therefore, he advocated the free clinic. This system must not be confused with the pay-diagnostic clinics now being tried out in North America. Here the medical staffs are paid and the charges are calculated upon a cost basis.

Reference to the beneficent effect of magnesium chloride in cases of dementia præcox was made by Dr. J. J. Heagerty of Ottawa. Most patients given this treatment show a marked physical improvement and a definite mental clearance. He deplored our pessimism respecting mental disease and thought that our exaggeration of the influence of heredity, was due in part to our general acceptance of certain unconfirmed family trees.

In this connection, the paper by Professor Julius Tandler, the well-known sociologist of Vienna, was unusually illuminating, as were also the movie films which he presented at the closing banquet. In Vienna, a suspected mental patient is now examined by an official examiner before being definitely committed. Observation wards are provided. This is much better than the system prevailing in many parts of Canada, where a practising physician, without special training and usually without hope of reward, must shoulder this moral and legal responsibility. Occupational therapy is developed much more than it is here. In one mental hospital of six thousand beds over 60 per cent of the patients are following occupations.

Dr. Tandler's work with school children is quite advanced and has been perfected under a Socialist Government, too. Twenty thousand school children are fed daily at noon from eighty kitchens at a charge of from nothing to three cents per week. They are not served mere "drinks" but are given seven hundred calorie meals. Every large apartment house has now a good day-nursery. Moreover, every child must learn to swim and for this purpose numerous "Freibaden" have been provided. Every child born in Vienna gets a free gift of a complete layette from the city.

Several innovations in other countries may interest our readers. In France, there is a Hospital Society for Mutual Insurance against accidents, open to hospital staffs and internes;

this scheme has been so successful that the insurance will shortly be extended to include sickness. Also the Hospital Union of South-East France has practised co-operative purchasing for ten years—a movement recently advocated in Canada. This Hospital Supply Society has been unusually successful. The British Hospitals Association now have organized examinations for their hospital administration certificate. The first examination is held after one year's service and the final examination after three years' service. The Warsaw Medical Society is now organizing a national hospital association, and is arranging for the publication of a hospital review and for the holding of a congress of hospital doctors. In Turkey, all doctors and nurses on hospital staffs are appointed directly by the Minister of Health and Social Welfare.

Those interested in nursing education, and in creating still higher nursing standards, will note the remark of Dr. Wm. Schroeder, Commissioner of Hospitals for New York City, that it is their "hope to make the nurse's degree equal to that of the doctor." This policy is hardly akin to that of Mr. Hoadley in Alberta who favours a two-year course to bring nursing service within the reach of the general public. Also, it is now proposed to have centralized teaching for some twenty or more New York hospitals. This has been done for some years in Toronto and elsewhere and has proved quite successful.

There had been some doubt before the congress as to whether such a convention would be successful. That doubt was completely dispelled and it was the unanimous decision of the delegates to meet again in Vienna in 1931. Very fittingly Dr. René Sand was reappointed Chairman and Dr. E. H. Lewinsky-Corwin of New York City reappointed Secretary-General. We wish this movement every success in the future and hope that it will prove still another bond to link together the nations of the world.

HARVEY AGNEW

THE TRAVELLING DIETITIAN

One of the many special problems of the smaller hospitals has been to provide a proper dietetic service. Not only is it necessary that the dietetic service be efficient from the viewpoint of the patient, but also from that of the nurses in training and the graduates on the staff. Few hospitals of less than one hundred beds capacity feel justified in employing a fully qualified dietitian. Some hospitals of fifty beds or over have dietitian-housekeepers. The smaller hospitals cannot afford such assistance.

To meet this deficiency, a part-time, or travelling dietitian has been recommended. In Saskatchewan, where the hospital workers are

very active and enterprising, this principle has been put into practice. At the last meeting of the Saskatchewan Hospital Association. Miss A. C. Langley, the travelling dietitian, described her work, the direction of which comes under the jurisdiction of Dr. F. C. Middleton, the Acting Deputy Minister of Health. Miss Langley travels about the province, visiting the smaller hospitals, and spending in each institution whatever time she considers necessary. That there was sufficient need for this service has been amply proved. Some hospital administrators displayed very little interest in the preparation or serving of the food. In one hospital, the planning of the meals was left to the Chinese cook; in another the matron was on holidays, and had left a menu to be repeated or changed at the cook's discretion. This menu, for one week, included roast pork, fried liver and onions, meat pies, fried fish and pie for dessert at least twice! They had not had fresh vegetables or fresh fruit all summer. The cook had never made junket or a baked custard.

The travelling dietitian not only reorganizes the kitchen service, a task requiring considerable tact in many instances, but it has been necessary to give a series of lectures for the nursing staff. Most of these lectures are given

to graduate nurses, because in the Union Hospitals the nursing staff is composed of graduates. Many of these lectures are given in the evening and are attended, not only by the nurses, but by the cooks and, in several instances, by ladies from the town. Each nurse attending the classes is given typed sheets, listing recipes, standard diets and other data.

While the work in Saskatchewan has been directed under the ægis of the provincial government, there is no reason why small hospitals elsewhere, acting privately, could not band together in small groups and support a circulating dietitian who would spend a period of weeks in each hospital and conduct an intensive course in dietetics while there. She would direct the policy of the kitchen and the entire dietetic department, and could so arrange the schedules that this department would function efficiently while she would be absent giving her lectures and demonstrations in the other hospitals. Such a scheme would enable the smaller hospitals to give their patients an up-to-date dietetic service and their pupil nurses an excellent course of instruction, without the heavy financial burden of entirely supporting a dietitian.

University Notes

UNIVERSITY NOTES

McGill University

Dr. W. W. Chipman, one of Montreal's best known doctors and professor of obstetrics and gynecology at McGill since 1912, has tendered his resignation to the board of governors of the university. Dr. Chipman is a native of the Maritime Provinces, having been born in Nova Scotia. He received his early education in Canada and then proceeded to Edinburgh University, where he obtained his Bachelor of Arts and Doctor of Medicine degrees. He graduated from Edinburgh in 1893 and later did post-graduate work in London, Paris, Vienna and Berlin. After graduation he was resident physician at the Edinburgh Royal Infirmary and the Royal Maternity Hospital and at the Bolton Infirmary. He returned to Canada at the close of the century and joined the teaching staff of the Medical Faculty of McGill University in 1900, being appointed demonstrator in gynecology. In the same year he was also taken on the staff of the Royal Victoria Hospital. His appointment as professor of gynecology came in 1910 and two years later he was named professor of obstetrics and gynecology. Dr. Chipman is well known both on this continent and in Europe.

He has been president of the Montreal Medical Chirurgical Society of the American Gynecological Club and of the American College of Physicians. He was made a F.R.C.S. by the University of Edinburgh and granted the honorary LL.D. degree by the University of Pittsburgh and Acadia University.

The Faculty of Medicine has received a gift of \$85,000 from the Rockefeller Foundation, to be used for research in experimental surgery. This gift is to be spread over a period of three years. Other gifts received are \$2,500 from Mr. Howard Murray for expenses in connection with the department of neuro-surgery, and the bequest of the medical books of the late Dr. F. S. Shepherd.

University of Alberta

Over 76 per cent of this year's students in Medicine who tried the examinations of the Medical Council of Canada, passed successfully. This is the fifth year since the final years in medicine were given in Edmonton, and the percentage of successful candidates at the Dominion Council Examinations indicates quite clearly that Alberta is taking her place in the list of successful medical universities.

Edinburgh University

Sir Alfred Ewing, F.R.S., and Lady Ewing received many tokens of regard on the eve of the former's retirement from the position of Principal of Edinburgh University. In April the retiring Principal received the Freedom of the City of Edinburgh. On June 11th portraits of Sir Alfred in his robes as Vice-chancellor, painted in oils by Mr. Henry Lintott, B.S.A., were presented to the University and to Lady Ewing at a large and representative gathering of subscribers. A letter of apology for absence was read from the Earl of Balfour, Chancellor of the University. Lord Provost Sir Alexander Stevenson, in presenting the portrait to the University, referred to the services of Sir Alfred Ewing to the State, outstanding among which was his work at the Admiralty during the war, and to the University, which he was leaving after a period of unexampled development and

expansion. He was carrying with him into his retirement the affection and esteem of very many friends. Sir John Gilmour, the Lord Rector, accepted the portrait on behalf of the University. The Lord Provost then presented a smaller portrait of the Principal to Lady Ewing as a personal gift to herself from the subscribers. On June 14th Sir Alfred and Lady Ewing received parting gifts from the students at a great gathering in the McEwan Hall. Mr. D. E. Keir, senior president of the Students' Representative Council, and Miss C. Hogg, junior president, made the presentations. The Principal made a delightful and highly characteristic reply. Another honour conferred on Sir Alfred Ewing was the degree of Doctor of Science of Oxford University. On June 22nd a reception was held in the Old College, Edinburgh, to welcome Sir Thomas Holland, the new Principal, and Lady Holland.

Topics of Current Interest

MEDICAL SCHOOLS AND HOSPITALS

AN AUSTRALIAN SURVEY

During the past two or three years there has been much questioning in the State of Victoria on the future of the Melbourne Medical School and its relation to the hospitals for clinical instruction. We reviewed in our issue of November 12th, 1927 (p. 892), a report of three representatives of the State who had been sent upon a mission of inquiry to the United States of America and Canada to investigate related conditions in those countries. This report has now been issued for general information, and there is bound up with it a further report by Professor R. J. A. Berry,* who formerly held the chair of anatomy in the University of Melbourne, and who was a member of the mission of inquiry.

He states that the war impressed upon all medical administrators the necessity for co-operation, the great value of the research hospital, and the vital importance of the medical centre devoted to community health. Yet in Melbourne today he finds a medical position that is the product and relic of mid-Victorian ideas. Medical education is carried out in a medical school that is detached from the clinical hospitals, and the several departments of the school are unrelated. The University has no control, direct or indirect, on the clinical hospitals; these have no common objective, and merely function as isolated and competitive units.

During his tour Professor Berry investigated 21 of the leading university medical schools of Canada, the United States, and Great Britain,

and some 115 institutions and hospitals. He gives a lucid and vivacious account of his observations. He maintains that everywhere he finds a change in the ideas that inspire hospital treatment and medical education. The objective of all medical effort is the patient. This conception demands unity of purpose, concentration of effort, and a constant investigation of the laws of health as well as the processes of disease. It is now universally recognized that medical research is an integral part of medical treatment, and consequently the modern idea requires the concentration on the one spot of all branches of medicine.

The examples Professor Berry gives of the vast equipment of certain of the Canadian and American medical centres are enough to arouse envy in the heart of many readers. But despite economic adversity, which he says is delaying advance in these islands, he finds concentration schemes in being in Aberdeen and Birmingham, and developments of pathological departments in the older universities of Oxford and Cambridge, which are practical proof of the community spirit in medicine. A change, also, he finds in building arrangements; there is concentration rather than dispersion. Instead of spreading the hospital building over a vast area the tendency in America is to build it up into the sky, and a picture is given of the New York State Psychiatric Institute and Hospital, which shows that it vies with the sky-scrapers. He indicates that this is not a mere fashion, but the expression of a real purpose. Hospital and school of medical and allied sciences are brought together in the one building.

"Anatomists and physiologists, pathologists and research fellows generally, may walk from their laboratories into the wards. The clinicians

*Report on the Hospital-Medical School Problems of the State of Victoria. By Professor R. J. A. Berry, M.D. Melbourne, Victoria: H. J. Greene, Government printer. Pp. 39. Price 1s. 6d.

have all the medical scientific departments absolutely at hand, which means that the full resources of medicine are at the service of every patient irrespective of his means. Such a combination is stimulating in the highest degree to every medical officer in the associated departments, whilst the benefits to the patient are incalculable, and cannot be attained in their entirety in any other way."

Professor Berry has something to say on hospital policy. Brought up in this country, where the voluntary hospital is the pivot of hospital work, he finds other methods elsewhere which he believes to be better. He suggests that it is a mistake to look upon the hospital as a place for the treatment of the poor. He prefers the American practice, based upon the idea that a hospital should be for all.

"American medical and hospital administrators have clearly recognized the justice of this contention. It is to-day the bounden duty of medicine to give every type of patient access to its hospitals, for only there can medicine give its best; but the labourer is worthy of his hire, and it is illogical in the extreme to suppose that, because the British type of voluntary hospital was based on gratuitous service by all concerned, that this more modern duty of medicine can be maintained on the same basis. In other words, if all classes of patients are to be admitted to our great hospitals, then the medical staff must be paid for their services. It is to the credit of the Americans that they have not only recognized the truth of this principle, but have had the courage to put it into practice, and in every one of the great university hospitals visited by me in Canada and the United States I found every member of the staff of both medical school and hospital was paid, and well paid, for their services.

His opinion, based on personal observation, is that under the new methods "the hospitals become self-supporting, and entirely free from that bureaucratic control feared by the more ardent supporters of the British voluntary system."

The problem before the Faculty of Medicine in Melbourne has been defined by Professor Berry in a letter published in the *British Medical Journal* of November 26th, 1927: "The Melbourne problem is, then, that which now everywhere confronts medicine: the seeking of the best combination of research, teaching, hospital, and laboratory in the cause of the national health—that is, the elimination of disease by study, research, and co-operative effort."—*Brit. M. J.*, 1: 700, April 13, 1929.

POISON IVY

Green leaves are on the poison ivy again, and at least some outings are bound to have unhappy after-effects. Chemists and botanists, however, unite in declaring that there is no longer any need for susceptible individuals to suffer hours of itching agony from a luckless contact with the evil weed. There are several very

simple remedies, made of common, non-proprietary chemicals, that will banish ivy poisoning in almost 100 per cent of all cases.

A preventive recommended by Dr. James B. McNair, of the Field Museum of Natural History, Chicago, is a five per cent solution of ferric chloride in water, or in a mixture of water, alcohol and glycerin. This is to be washed on all exposed skin surfaces before going into the woods, and allowed to dry without wiping. The thin deposit of iron salt neutralizes the ivy poison immediately upon contact. This remedy has been in use by the botany classes of the University of Chicago for several years, with very good results.

For persons who have had the ill luck to become poisoned, Dr. James F. Couch, of the U. S. Department of Agriculture, recommends a wash of a three per cent solution of potassium permanganate. This oxidizes the poison, and healing follows rapidly. This remedy leaves the skin brown, but the stain may be removed with a one per cent solution of oxalic acid. Any of these remedies can be mixed by any druggist, without a prescription.

Poison ivy is really a misnomer, for the plant is not related to the common ivy. It is a sumac, and closely related to the even more vicious poison sumac that grows in our bogs. Poison ivy can be recognized easily by the three-parted leaves, which have given rise to the old saying: "Leaves three, let it be!" The plant may either climb trees by means of aerial roots that cling to the bark, or it may creep along just under the surface of the soil, sending up thickets of short, woody shrubs from a foot to three or four feet high. In this latter form the plant is sometimes called "poison oak," but that name is incorrect; it belongs by rights to a related shrub of the Pacific Coast.

Poison sumac troubles fewer persons than poison ivy, but those who are susceptible get hit harder. It is perhaps providential that this shrub grows only in acid-water bogs or on their borders, where only botanists or determined hikers venture. But where a road has been built through boggy country even automobilists will sometimes come to grief from it. It looks very much like ordinary sumac, but can be distinguished by its pale gray bark and its drooping clusters of white berries.

The "lacquer poisoning" with which some persons occasionally become afflicted is a form of ivy poisoning. Oriental lacquers are made from the gummy sap of a species of sumac that is related to the poisonous American species.—*Science*, May 24, 1929.

TREATMENT OF IVY POISONING

In the event of coming in contact with poison ivy, endeavour to obtain some jewel weed, crush this and apply the juice to the part affected. This is one of the most reliable antidotes you can possibly get and the jewel weed is usually avail-

able as it grows in low, wet, marshy places, to a height of from two to four feet. It has a juicy-looking stem that is semi-translucent, and it is usually studded with orange-coloured hanging flowers, with brown spots on them. These flowers hang gracefully, and if you remember the combination of pale green juicy stem and a yellow or orange flower with brown spots, you can usually locate it without any difficulty.

If you are unable to get the jewel weed, you will very often find satisfactory results from using freely, strong laundry soap. We emphasize "laundry" soap, because it is necessary to have a soap containing an excess of alkali. In fact, fresh lime water, as you get it from your druggist, answers the purpose very well in many cases.—*Health Bulletin*, Toronto, June, 1, 1929.

SCARLET FEVER

Much interesting work has been done in recent years in connection with the ætiology, diagnosis, prophylaxis and treatment of scarlet fever.

A variety of hæmolytic streptococcus called *Streptococcus hæmolyticus scarlatinae* appears to have better claims than any other organism to be the cause of scarlet fever, though the claims made on its behalf have not received universal recognition, rival views being held by various observers in Germany, Austria and Switzerland. Intradermal injection of the toxin of the *S. scarlatinae* is supposed to produce in susceptible subjects and also in the first few days of scarlet fever a reaction similar to the Schick reaction and known as the Dick reaction, and none in those who are not susceptible, including convalescents from scarlet fever, who possess an antitoxin capable of neutralizing the scarlet fever toxin. There is a fairly general agreement, however, that the Dick test is not quite so reliable a guide in scarlet fever as the Schick test is in diphtheria owing to the varying results yielded by the toxins of different strains of *S. scarlatinae*. As regards its diagnostic value my experience has been that it is too frequently negative in the first few days of the eruption and positive in convalescence to be of much assistance.

Another recent method to which considerable diagnostic value has been attached, especially by those whose clinical experience of scarlet fever is comparatively small, is the Schultz-Charlton or extinction phenomenon, which consists in blanching of the eruption when a small quantity (0.2 c.c.) of anti-scarlatinal serum is injected intradermally. I have but rarely derived any help from the use of this method, as I have found as a rule that the blanching is only well marked when there is no doubt as to the scarlatinal nature of the eruption and faucial condition, and even in such cases blanching does not always take place.

Recent work on the prophylaxis of scarlet fever has mainly been concerned with active immunization by scarlet fever toxin modified or

sodium ricinoleate which modifies the toxin without impairing its antigenic properties, or with passive immunization by scarlet fever antitoxin. During a recent epidemic in Poland, where the mortality in 1926 was as high as in London fifty years ago, i.e., about 13 per cent, Sparrow and Kaczynski actively immunized 15,000-odd children who were found by the Dick test to be susceptible to scarlet fever, with the result that the incidence of the disease was three times less among the inoculated than among the un-inoculated.

Active immunization with *S. scarlatinae* toxin has also been carried out on a large scale in the United States. Owing to the much lower degree of toxicity of scarlatinal as compared with diphtheria toxin, it is often used by itself without any counteracting antitoxin, but Larson and his collaborators, who found that sodium ricinoleate was an effective agent in detoxifying the toxin, have used a soap-toxin mixture which produced a rapid immunity without causing objectionable symptoms.

In the case of nurses active immunization against scarlet fever is not to be urged, as not only is the disease much less serious, but its incidence among them is naturally much lower than that of diphtheria. At my own hospital during the last three years, in spite of the absence of immunization, only 8 nurses have contracted scarlet fever, in each case of a mild character, as compared with 14 who developed diphtheria, most of whom had been given toxin-antitoxin.

In this country the chief work in active immunization against scarlet fever has been done in the cases of the nursing staff of the fever hospitals of Edinburgh, Manchester and Birmingham. At the Edinburgh City Hospital, e.g., Benson and Simpson found that by injection at intervals of five to fourteen days of gradually increasing doses of scarlet fever toxin it was possible to render the majority of Dick-positive reactors Dick-negative. If the dosage was carefully graded, immunization could be accomplished without any unpleasant reaction or permanent ill-effects. While, however, active immunity could be obtained by injection of relatively small doses of toxin, its duration in originally Dick-positive cases was only a few months, and if more lasting immunity was desired in Dick-positive reactors, much larger doses of toxin were required.

The intranasal route, as in active immunization against diphtheria, has been employed in a small number of cases recently by Ramon and Zoeller, who found that instillations of Dick toxin into each nostril made a positive Dick reaction negative.

Before leaving the subject of prophylaxis of scarlet fever a word may be said as to the method called after the late Dr. Robert Milne, Medical Officer to the Dr. Barnardo Homes. This method which consists of inunction of the skin with eucalyptus oil and application of 1.20 carbolic oil to the tonsils, has been definitely shown to be

valueless by Milne's successor, Dr. Gushue Taylor, as it does not prevent the spread of infection or the occurrence of complications and return cases.

Coming now to the treatment of scarlet fever, I may say that the use of a specific antitoxin in the disease forms one of the most interesting and valuable practical results of recent research. Owing to the mild character of the disease prevalent in London my experience of the remedy during the last three years has been rather limited, as I have not followed the example of some enthusiasts who recommend the use of antitoxin in every case of scarlet fever, as is the rule in the treatment of diphtheria. My practice has been to reserve the serum for cases of any degree of severity. Since March, 1926, I have had only 320 cases out of over 3,000 scarlet fever admissions which were given serum. These I have grouped in three classes—(A), (B) and (C), according to the effect of the serum. In Class A were 170 cases in which the benefit appeared to be immediate and well-marked. In Class B were 125 cases in which the benefit though definite was less rapid and pronounced, and in Class C were 25 cases which derived no benefit from the serum and the deaths numbered 6.

A serum rash, usually urticarial in character, occurred in 74 cases (23.1 per cent), but in only ten there was any pyrexia with some constitutional disturbance, and sometimes there was secondary adenitis and pains in the joints such as are met with in serum sickness due to other sera. Since the employment of refined serum, however, the incidence and severity of serum sickness have been greatly reduced.

I have been much impressed by the action of serum in septic cases in which the tendency to ulceration of the throat is apparently checked by this means. There is also often a striking improvement in the general condition, though the temperature does not always fall by crisis to normal.

In scarlet fever of any severity it is even more important than in diphtheria that the serum should be given early, as in late cases, contrary to what I have emphasized in diphtheria, it appears to have little if any effect, and my experience like that of the majority of other observers has been that it does not prevent the occurrence of complications.—(J. D. ROLLESTON, M.A., M.D., M.R.C.P., Medical Superintendent, Western Fever Hospital, London, in the *Post-Graduate M. J.*, 4; 159, June, 1929)

THE COCKTAIL HABIT IN FRANCE

In the *British Medical Journal* of January 9th, 1929, page 31, was noted Professor W. E. Dixon's warning about the injurious effects of cocktail addiction; recently a similar denunciation has been made at the Académie de Médecine by Professor Georges Guillain, who occupies the chair of nervous diseases in the Paris Faculty of

Medicine. Before the war, he states, this practice, imported from America, had been confined to certain sections of French society, particularly racing, literary, and dramatic circles, but lately it has become prevalent among the well-to-do classes generally. The cocktail bar is to be found not only in hotels and restaurants, but even in the homes of the rich. Furnishing firms make it their business to supply more or less elegant bars suitable for drawing rooms, even for motor cars, while special hampers containing the ingredients and utensils used in the preparation of cocktails are on sale everywhere. As in this country, the principal victims of the habit are young men and women of the "smart" set, and among them Professor Guillain has often found obvious signs of chronic alcoholism. Commonly met with are digestive disturbances, manifested as loss of appetite, hyperchlorhydria, pyloric spasm, congestion of the liver, and enteritis, and such circulatory symptoms as tachycardia, precordial pain, and a tendency to syncope. The most important disorders, however, are referable to the nervous system, and include insomnia, physical and psychical asthenia, depression, and disinclination for mental work. In several instances epileptic attacks, attributed to the cocktail habit, have occurred for the first time in individuals of 25 to 35 years of age. Professor Guillain urges that young people of the wealthy classes should be enlightened as to the disastrous effects of cocktail drinking, both on their own physical and mental equilibrium and on that of their descendants.

SPIROCHÆTAL EMPYEMA

At a meeting of the Section of Pathology of the Royal Academy of Medicine in Ireland in the Royal College of Physicians, on April 19th, with the president, Dr. T. T. O'Farrell, in the chair, Dr. J. McGrath showed a patient with spirochætal empyema.

A farmer, robust in appearance, was admitted to St. Vincent's Hospital on February 8th. He gave a history of "never being sick in his life" until he felt ill on December 23, 1928, when his local medical attendant sent him to bed for several days, telling him that he was suffering from influenza. He was out and about again after Christmas, but grew progressively weaker as time went on. On his admission to hospital the temperature was 101° F., the pulse 80, and the respirations 20 per minute. There were no physical signs indicative of chest or other trouble; the urine had a slight trace of albumin, but the sediment contained no pus, blood, or casts. For the succeeding few days his temperature was normal, but at the end of a week it was 99.5° F. in the evening for four days. After February 17th, when he was operated on, the temperature remained continuously normal, the pulse 72, and respirations 20. On February

16th there was slight dullness at the base of the left lung; it was needled and a small amount of brownish red pus was withdrawn. This pus contained many cells and moderately numerous spirochaetes. No other organisms were seen in the smear preparations, and on culture no growth appeared either aerobically or anaerobically. The spirochaetes found were then non-motile and stained easily, being Gram-negative; they were 4μ to 10μ long, rather thick, and with two to eight undulations. They resembled *S. refringens*, but several of them appeared too short and too regularly curved to be this spirochaete. A blood count on February 17th showed red cells 4,120,000 per c.mm. (82 per cent), haemoglobin 55 per cent, colour index 0.7, white cells 15,680 per c.mm. The red cells showed very slight anisocytosis, and of the white cells 79 per cent were polymorphonuclear leucocytes, and 1 per cent were eosinophils. Tubercle bacilli could not be found in the sputum, nor could spirochaetes (which are sometimes to be found in large numbers in bronchiectasis); the Wassermann reaction was negative. On February 17th two ribs were resected, and several pints of tomato-soup-like fluid were evacuated; this fluid gave similar results to the small specimen first examined. A drain was left in. The pleural cavity was still draining, but on April 12th the fluid showed no spirochaetes, and produced a growth of pneumococci and a coliform organism. The patient was given injections of novarsenobenzol, and a vaccine had been prepared from the last cultures of the fluid. The urine, on April 17th, contained a considerable amount of albumin, several hyaline and some granular casts; but the patient's condition appeared to be good.

Dr. McGrath said that few cases of spirochaetal empyema appeared to be recorded, especially where not associated with gangrene of the lung and without other organisms. A case with spirochaetes in an empyema but with gangrene of the lung had been recorded by some French observers in May, 1928, but Dr. McGrath had been unable to obtain the original paper. In the present case he was assured that there was no suggestion of gangrene of the lung. The patient's teeth were in good condition, but showed one small and one moderately large cavity. In view of the fact that it had been stated that in cases of tropical broncho-pulmonary spirochaetosis the *S. castellanii* could nearly always be isolated from bad teeth, smear preparations of scrapings from the patient's teeth cavities were examined. There were very numerous micro-organisms present, but spirochaetes could not be found.

The President said he had never seen a similar condition to that shown by Dr. McGrath. He thought at first that the spirochaete might have come from a cavity in the lung, but understood

that clinicians who had seen the case said that this was not so. Professor J. W. Bigger stated that spirochaetes were found in gangrenous conditions, but nearly always in association with other organisms. It was rare to find them confined to the pleural cavity. Professor Beattie drew attention to the large number of spirochaetes present, and their thickness, and thought that they might possibly have come from the teeth, but apparently this was not the cause.—*Brit. M. J.* 1: 957, May 25, 1929.

YEAST AND PUFFERY

Under the title of this comment, the *British Medical Journal* a few weeks ago called attention to some "highly objectionable advertisements of a proprietary brand of yeast" that were appearing in American and Canadian periodicals that circulated also in the British Isles. These advertisements, according to our British contemporaries, were of the testimonial type and purported to be signed by European or American medical men. While not mentioned by name, it seems quite obvious that the *British Medical Journal* referred to the blatant series of advertisements that the "Fleischmann's Yeast" concern has been running recently. As the result of the editorial comment, a well known London physician has written to the *British Medical Journal* and briefly recounted his experience in this field. To quote:

"On April 3rd of last year my secretary made an appointment for me to see a Miss E. She duly appeared, not, however, in the guise of a patient, but in that of an advertising agent for a well known brand of yeast. Her proposition to me, made most charmingly, but in the best American business manner, was that I should write a testimonial extolling the virtues of yeast, this testimonial, together with my name and photograph, to appear in magazines, newspapers, and (or) in other advertising media published in the United States of America and Canada. For doing this I was to receive the sum of £150 (\$750). To quiet any scruples I might have against so doing, I was informed that four members of my profession in London had already signed the agreement, a copy of which is here appended."

The physician added that, while showing the advertising agent to the door, he suggested that there were other things in life that he valued more than one hundred and fifty pounds! In this connection, our readers may be interested in the following incomplete list of European and American physicians whose names (and pictures) have been used by the Fleischmann people in their recent advertising campaign. Of English physicians, we find the following four, described as quoted:

"Dr. Leonard Williams, prominent physician," London.

"Sir W. Arbuthnot Lane, Bart., C.B., England's great surgeon."

"Dr. L. F. Roebuck Knuthsen, O.B.S., eminent British skin specialist."

"Sir Bruce Bruce-Porter, K.B.E., C.M.G., one of the best known English physicians." From France there are given:

"Dr. Clemont Simon, skin specialist," Paris.

"Dr. Georges Caussade, Laureate, Faculty of Medicine," Paris.

"Dr. Georges Rosenthal. . . . Paris."

"Dr. Victor Pauchet, eminent Paris surgeon."

"Dr. Gaston Lyon, one of the outstanding figures of the medical profession in France." From Germany and Austria:

"Prof. Dr. Adolf Cluss, international authority on nutrition."

"Prof. Dr. Paul Reyher, lecturer, University of Berlin, on vitamins, X-Ray and Pediatrics."

"Prof. Dr. Carl Neuberg, Lecturer University of Berlin."

"Dr. Laszlo Berczeller, a leading Austrian nutrition expert."

"Dr. Kurt Henius, famous lecturer at University of Berlin."

"Dr. Viktor Grafe, Vienna's official food expert."

While last, but not least, expert testimony from America comes from:

"Dean H. H. Rusby, M.D., Professor of Physiology, College of Pharmacy, Columbia University, says in his forthcoming book. . . ."

"Dr. George Parrish, well known Health Officer of Los Angeles."

"Dr. Ira L. Hill, prominent New York physician and abdominal surgeon."

Whether any, or all, of these physicians received £150 or its equivalent in francs, marks, crowns or dollars, we do not know. From those who did not, we shall, in the words of our British contemporary, be pleased to have "the opportunity of publishing their disclaimer."—*J. Am. M. Ass.* 92: 2025, June 15, 1929.

Special Correspondence

The London Letter

(From our own correspondent)

The Labour Government and the Profession.—Parliament has begun its session with a Labour Government in office and the medical profession is represented by about as many members as before, scattered on both sides of the house. It is interesting to speculate to what extent socialism will be applied to the organization of the health services of the nation for already the Ministry of Health, the Insurance Act and all the various municipal health activities would be viewed as frankly socialistic schemes by citizens of fifty years ago. In two directions there appears to be some urgent need for "state interference": one concerns the training of nurses. At the present time the nurse comes to hospital partly to nurse the sick but mostly to learn her art and the educating of the nurse is forming an increasingly important part of every hospital's duties. At the same time as she has to study hard to take the examinations supervised by the state she has to work very long hours at wages which no trade union would look at for a moment. The standard of preliminary education has now been raised so that only a well-educated girl can gain admission to many of the large hospitals and yet she has to spend an undue proportion of her time cleaning, washing-up, fetching and carrying, all of which could very well be done by less well-educated em-

ployees, only the hospital would have to pay much more for such labour than the nurse receives. At the same time the senior nurses and sisters have so much administrative work to do and so much direct responsibility to the medical staff that they have little time for carrying out that teaching at the bedside which is so essential for learning the art of nursing. Such is the present situation and perhaps a Labour Minister of Health may see fit to tackle the problem. The second direction in which the state may well take early action concerns the cripple. From the days when cripples were regarded with fear and repugnance we have moved a long way but it is still too prevalent a view that cripples must be treated in charitable institutions and homes as burdens upon the community. In a paper read earlier this year before the Medical Officers of Schools Association that great authority Sir Harry Gauvain outlined a bold national policy whereby he estimates it should be possible to prevent 70 to 90 per cent of the amount of disability at present occurring. Alongside of such a policy of prevention he pleaded for an extension of the hospital school principle so that the crippled child's mind can be adequately trained and the patient satisfactorily fitted to enter the world again when a cure has been effected. The Board of Education already helps by grants but what is required is pressure upon such areas as do not at present make provision for the physically defective child.

Anti-anti-vivisection. — Two meetings concerned with the subject of vivisection have recently been held and both ended in considerable turmoil. The British Union for the Abolition of Vivisection attempted to hold a meeting at the Caxton Hall last month but it ended with the entrance of the police to arrest interrupters, while Professor A. V. Hill's third Stephen Paget Memorial Lecture also ended in "considerable turmoil." Professor Hill took a very high idealistic line in his address entitled "Enemies of Knowledge." Instead of maintaining that vivisection is useful or that it is necessary he held that it is a means of finding out things that could not be discovered by any other method. In other words any attempt to hinder the advance of knowledge for its own sake cannot be too emphatically condemned by the true scientist. Incidentally Professor Hill was moved to indignation by some of the tactics of the anti-vivisectionists and he especially mentioned the case of a parish priest of a well known London suburb who urged his flock in his parish magazine not to support a Government at the last election which spent £148,000 last year on the work of the Medical Research Council. To anyone who has even the slightest knowledge of the magnificent way in which this money, actually the surplus raised by the Insurance Acts, is used, such a plea is entirely unwarrantable and it is right that the attention of a wider audience should be drawn to such interference, in the name of religion, with the pursuit of knowledge.

Keeping London Clean. — It costs over two million pounds each year to keep this great city clean and the methods whereby this vast sum is expended by all sorts of municipal authorities are not, to say the least, economic or logical. Parts of the public cleansing system are admirable, the network of great sewers is probably a triumph of engineering, but on the other hand stinking rubbish heaps on the lower reaches of the Thames are a crying disgrace. A recent report issued by the Ministry of Health is frankly a revelation of sanitary failure and it is strongly urged that some central body be created for co-ordinating all the work of the local sanitary authorities. The problems revealed by this report are not so much medical as governmental but the profession is entitled to be alarmed when the Ministry's investigator describes refuse dumps as "reeking masses" and refers to "rat infestation" and "fly-feeding belts" in a district quite close to human habitations. London must obviously take its sanitation in hand in the near future.

ALAN MONCRIEFF.

London, July, 1929.

The Edinburgh Letter

(From our own correspondent)

On May 15th, His Royal Highness Prince George opened the new Department of Zoology which has been erected by the University of Edinburgh on the south side of the city. This is the second of what are called "The King's Buildings." His Majesty the King laid the foundation stone of the first of these, the Chemistry Department, nine years ago. A third building is in the course of construction for the Animal Breeding Research Department. The new Zoology Building cost £80,000. The Professorship of what used to be called Natural History dates from 1770. More than fifty years ago the Professor was Wyville Thomson, famous as the leader of the "Challenger" Expedition, which carried out a world-tour of scientific investigation. After him came Professor Cossar Ewart who was head of the Department for forty-five years. There many thousands of students gained their training in zoological science, including some who are now the heads of important schools, such as Professor J. P. Hill, F.R.S., of University College, London; Professor Cole, F.R.S., of Reading; and Professor Greig Wilson of Belfast. Professor Ewart played an important part in laying the foundations of that section of zoological science known as Genetics, which in Edinburgh University forms the subject of a special Chair. The Zoology Department in its new home will be under the direction of Professor Ashworth. After the opening ceremony had been performed the honorary degree of Doctor of Laws was bestowed upon Prince George.

Among other ceremonies arranged to honour the Principal of the University on his retirement, a torch-light procession was held last March. The procession consisted of twenty decorated lorries and several hundred gaily dressed students. It wended its way through the principal streets of the city and stopped before Sir Alfred Ewing's house in Moray Place. From the balcony the Principal addressed the students who indicated their affection for him and their regret at his resignation.

The Annual Exhibition of the Royal Scottish Academy was adorned by at least two portraits of Academic interest. The first, of the Principal of the University, Sir Alfred Ewing is by Mr. Henry Lintott, R.S.A. This was presented on the 11th of June in the Upper Library Hall. The second is a portrait of Sir Leslie Mackenzie, by Mr. Henry Kerr, R.S.A. This was presented to him by the Scottish branch of the Society of Medical Officers of Health and the Scottish Society of School Medical Officers, on the occasion of his retirement from the Board of Health.

Sir Robert Philip, the Professor of Tuberculosis, has received the degree of Doctor of Medicine *honoris causa* from the University of Egypt.

Professor Sidney Smith has been awarded the Swiney Prize for 1929. The award is adjudicated by the Royal Society of Arts and the Royal College of Physicians of London. The Prize, which consists of £100 and a silver cup, is the gift of the late Dr. Swiney, who died in 1844, leaving a sum of money to provide for a quinquennial award for the best published work on jurisprudence.

Sir Norman Walker was the lecturer at the third Malcolm Morris Memorial Lecture, arranged by the Chadwick Trustees at the Royal Society of Arts, London. Sir Norman chose as his subject "The progress of dermatology over fifty years." He described the conditions in Edinburgh in 1880, when there were no skin wards in the then new Royal Infirmary, and after dealing with the progress of dermatology, struck a note of warning regarding certain forms of light treatment. He counselled the younger generation not to neglect altogether the old remedies and the principles which lie behind their use.

The Morison Lectures, before the Royal College of Physicians of Edinburgh, were given by Dr. R. Dods Brown, of the Aberdeen Royal Asylum, on the 3rd, 5th and 7th of June. Their title was "Some observations on the treatment of mental disease."

The annual golf match between the Royal Colleges of Physicians and Surgeons took place at New Luffness Golf Club, on May 20th. The College of Surgeons won by 17 games to 6.

The Harveian Festival was held on May 31st, in the Royal College of Physicians. Dr. Lewis C. Bruce, President of the Harveian Society, presided over a gathering of more than a hundred, which figure constitutes a record. The President chose as the theme for the Oration "Life and customs in the time of William

Harvey." After an interesting and inspiring address the society and its guests dined in the hall of the College.

The death of the veteran Liberal statesman Lord Rosebery recalls the fact that one of his ancestors, Gilbert Prymoss was the first Deacon of the "Craft of Chirurgeons," which in 1583 was granted pre-eminence amongst the Trade Guilds of Edinburgh. This was the same body as the Corporation of the Surgeons and Barbers, whose original seal of cause was granted in 1505, eight years before the battle of Flodden, and which we now know as the Royal College of Surgeons of Edinburgh. In 1558, three years before the return of Queen Mary to Scotland, Gilbert Prymoss was one of twenty-five apprentices who were sent by the Incorporation to join a corps raised for the defence of Edinburgh against "our auld inemyes of England." He became surgeon to James VI and accompanied the King when he went south to assume the Crown of England. He died at Westminster in 1616 at the age of 80. Dr. Peter Lowe, the founder of the Faculty of Physicians and Surgeons, Glasgow, was a friend of his, and inscribed his treatise on Chirurgery to him and to James Harvey, another Fellow of the Craft of Surgeons. One of the possessions of the late Earl of Rosebery was a brass mortar and pestle bearing the name of Gilbert Prymos. A replica of this is preserved in the Museum of the Royal College of Surgeons. The connection with the family of Primrose was carefully maintained as the late Earl was an Honorary Fellow. At the Quadricentenary of the foundation of the College in 1905, the Earl of Rosebery was the guest of honour and gave one of his most eloquent addresses at a banquet given to celebrate the occasion. A grandson of Gilbert Prymoss was created a baronet of Nova Scotia by Charles I in 1651.

GEORGE GIBSON.

23 Cluny Terrace, Edinburgh.

Harry Gold and Arthur C. DeGraff in making studies on digitalis in ambulatory cardiac patients found that regarding the use of digitalis it is essential to bear in mind the practical distinction between (1) types of failing circulation in which the use of the drug results in striking improvement, and (2) types of failing circulation in which the use of digitalis is indicated on the basis of certain experimental data and theoretical considerations, but in which clinical study thus far gives evidence of little, if any, beneficial effect. It is pointed out that numerous errors in the interpretation of clinical observations have arisen from failure to consider this distinction. There is no essential difference between the behaviour of digitalis in children and in adults. The drug is less often seen to produce striking improvement

in children than in adults because the type of heart failure that is relieved most effectively by digitalis (congestive heart failure without active infection of the heart) is relatively common in heart disease among adults but relatively rare in that among children. In those cases in which less definite therapeutic effects are obtained, insufficient or excessive digitalization is more apt to occur because of the absence of a satisfactory guide to the intensity of digitalis action. Digitalis cumulation, as occurring in the course of the daily administration of a suitable fixed dose of the drug, can be shown to be a self-limiting process. The intensity of digitalis action present at the time when further cumulation ceases to occur depends on the size of the daily dose.—*J. Am. M. Ass.*, 1929.

Letters to the Editor

To the Editor:

Much is being said and written in all parts of our country to-day on the question of state medicine. In some parts of Canada this is not only talked and written of but is practised to some degree.

There is a cry going up from the public, upon whom we depend for our living, (at least those of us who are in private practice), that medical and surgical fees are too high: that the cost of being ill is becoming out of reach entirely of the middle class. What will the outcome of all this be? Does anyone attempt a guess at this time? Older men than I have answered in different ways when the question has been put to them. Some will say that they think state medicine will be here in twenty-five years, others say that it will never come. Yet what are our medical schools doing to help solve this problem? What about a department of medical economics in our medical schools? The professor of medicine in one of our leading medical schools, when the suggestion was made to him said, "That is most impracticable." But is it?

How many of our young graduates know anything about the following problems that they will meet with when they get their parchment. The selection of a practice. Buying a practice. Starting a new practice. Purchase of equipment for practice. Records in practice, including business records. Investments outside of practice. Methods of collection, and a dozen other little things?

And some of the older practitioners will say, "Why should we worry about the young fellow starting out?" The answer is: because the medical profession generally need the lessons of the older practitioner's economic faults.

Why it is not possible to have such a course as this established? Leading men from the towns, the cities, general practice, specialist practice, industrial practice, might be asked to come and give to the graduating classes something of their problems when they set sail. A prominent financier might be asked to tell the final year about investments and speculation. Every stock salesman calls on the medical men first when he hits a new town.

Mr. Editor, all of this may seem utterly ridiculous to many, but there are nation-wide problems which such a department might help to solve as well as the individual problems of the average medical man who cannot afford a paid bookkeeper or an efficiency expert. We might raise the status of our entire calling from that of being the last to be paid to that of being first. Then, when everyone pays, the cost of being ill will certainly fall and every patient will have an opportunity of getting decent medical and surgical treatment at a reasonable rate.

Yours very truly,

"The Country Doctor."

June 24, 1929.

Abstracts from Current Literature

MEDICINE

Chronic Appendicitis. Deaver, J. B., *Am. J. Med. Sci.* 177: 749, June, 1929.

Dr. Deaver takes issue squarely with those who say that chronic appendicitis is not a clinical entity. It is important that erroneous views on this matter be not allowed to pass current, inasmuch as such will cost human lives. Chronic appendicitis is as much an entity as chronic peptic ulcer or chronic cholecystitis.

Chronic appendicitis cannot always be diagnosed by means of the x-ray, for pathological change may so obstruct the lumen of the appendix that bismuth or barium cannot enter therein.

Chronic appendicitis may result from a previous acute attack, but may also be traced sometimes to a low grade intestinal infection.

Chronic appendicitis, the result of previous

acute attacks, is followed by intermittent attacks of slight pain, epigastric distress, occasional nausea, and more or less gaseous distension, particularly of the small bowel, a syndrome that at times is impossible to differentiate from a mild chronic cholecystitis, a typical duodenal ulcer, or a slight chronic pancreatitis. Palpation elicits rigidity of the overlying abdominal muscles, tenderness, and often, also, reveals an enlarged appendix.

In the second form, the symptoms come on insidiously, with indigestion, slight abdominal discomfort, and mild intestinal distension. Violent exercise, or fatigue, causes discomfort in the right lower abdomen, and, not infrequently, pain. Here skilful palpation will reveal characteristic findings; more or less loss of flexibility of the overlying abdominal muscles, tenderness, and, often, a palpable appendix.

The conditions most often confused with

chronic appendicitis are: chronic peptic ulcer, chronic cholecystitis, a mobile splashing and tender caecum, with or without coloptosis or visceroptosis, stone in the right ureter, carcinoma of the caecum, tuberculosis of the caecum, tuberculosis of the peritoneum, tuberculosis of the ileo-caecal lymph-node, diverticulosis, chronic diverticulitis, retroperitoneal lymphangitis, effusion into the sheath of the psoas muscle, early psoas abscess, chronic right-sided pyelitis, stricture of the right ureter, and a chronic lesion of the right uterine appendages. The most commonly met with of these conditions are, carcinoma and tuberculosis of the caecum, pyelitis, and chronic disease of the right uterine appendages.

That the chronically diseased appendix is a menace is evidenced by the fact that it is found to be affected in practically all cases of abdominal disorders, such as chronic cholecystitis and chronic peptic ulcer, so that it must be a factor in the etiology of these conditions. In all abdominal infections the appendix is the most common site of the trouble.

The fact that all patients who are operated upon for chronic appendicitis are not relieved of all their symptoms does not prove that there is no such entity. The appendix is the most important source of focal infection, as is borne out by the experience of surgeons, who find upper abdominal inflammation and appendiceal inflammation associated together in practically every case.

A. G. NICHOLLS

Penetration of Ultra-Violet Rays Through Fabrics. Latzke, A., *Am. J. Hygiene* 9: 629, May, 1929.

But little work has been done with fabrics in regard to their penetration by ultra-violet rays. The author has carried out a series of experiments designed to determine the protective action of certain black or white fabrics for bacteria, when light rays are allowed to penetrate the fabrics, and when the rays exerted their action on fabrics inoculated with bacteria. A comparison was also made between certain cotton, linen, woollen, and silk materials as far as the nature of the fibre and its colouring influenced the germicidal action of light. The bactericidal action of light is confined to the ultra-violet region of the spectrum, beginning at 380μ and extending with increasing intensity to the shortest measurable wave-lengths (185μ).

Some of the author's more important conclusions are the following.

A ten-minute exposure to ultra-violet rays is more effective in its germicidal action upon organisms on white cotton, linen, and silk fabric than on woollen fabrics having a similar per cent interspace.

Ultra-violet light has a less prolonged germicidal action upon organisms exposed on black

material than on white, though more tests must be made before conclusions should be drawn as to the relations between fabrics.

When the fabric is used merely as a screen for light rays, and the time of exposure is uniform, black offers more protection for bacteria than white material of similar interspace.

Light seems to have more germicidal power when transmitted through linen and silk materials than through those composed of cotton or wool.

The size of interspace of the fabric appears to be of more importance in permitting the germicidal action of ultra-violet light than is colour.

A. G. NICHOLLS

SURGERY

The Prevention of Peritoneal Adhesions. Gellhorn, G., *Surg., Gyn. & Obst.* 47: 817, June, 1929.

Dr. Gellhorn cannot unreservedly accept the view that it is impossible to prevent peritoneal adhesions after laparotomy. He admits that there are patients whose peritoneum is abnormally sensitive, and there are the cases in which infection makes adhesions a certainty. But putting these aside, he thinks that in the majority of these operations there is something wrong with the technique which allows the formation of adhesions.

Many remedies have been advocated, and continue to be evolved, but we should not expect too much of any one procedure. The best and soundest method is to take precautions throughout the entire operation. Some of the common slips in operative technique are mentioned: for example, the gloved hand should not be introduced into the abdominal cavity without being first rinsed in saline, as otherwise it will carry in irritating chemical substances, such as picric acid, iodine, or other skin disinfectants. The same possibility is to be kept in mind when loops of bowel are allowed to escape and lie on the abdominal skin. The unprotected pressure of retractors leads to mechanical irritation of the peritoneum. Energetic sponging of the abdominal cavity, or even sudden or forcible flooding with saline solution, may lead to damage. Closure of the peritoneum should always be done with broad adaptation of the cut edges and eversion.

These are mistakes which are frequently made, but which can be easily avoided with care. Further suggestions are made. The walling off of intestines should always be done with wet, warm materials. Gauze or towels have the disadvantage of irritating the peritoneum and tending to cool it by evaporation. Dr. Gellhorn uses sheets of pure rubber, which are kept in warm saline solution till needed. These are smooth, are easily boiled, and do not

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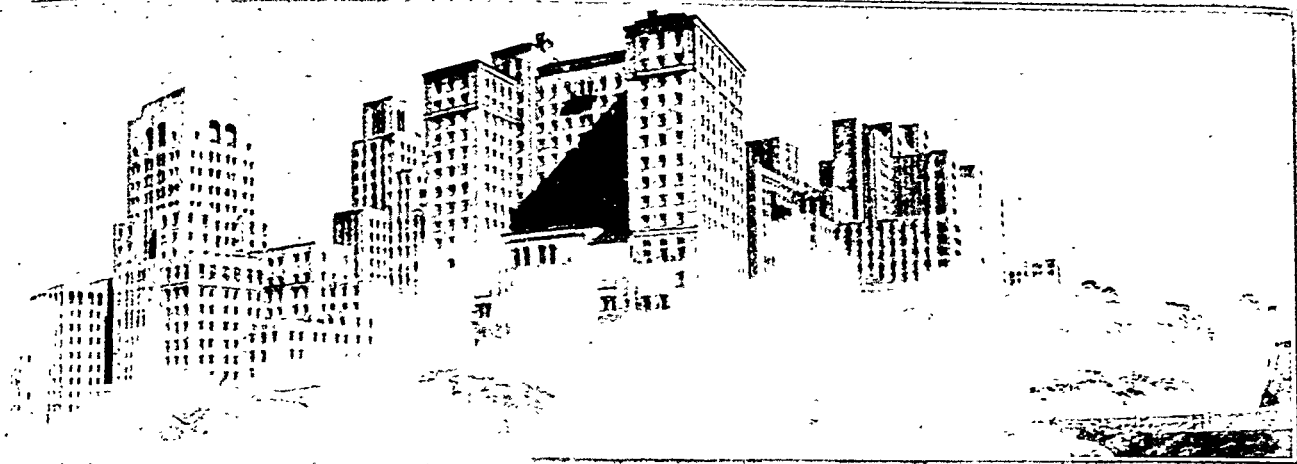
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Diseases of Infants	Sept. 9 to Sept. 21—Infants Hospital. Afternoons. Fee £3 3s. 0d.
Psychological Medicine	Sept. 10 to Oct. 5—Bethlem Royal Hospital. Tues. and Sat. 11 a.m. Fee £1 1s. 0d.
Medicine, Surgery and the Specialities	Sept. 16 to Sept. 28—Westminster Hospital. All day. Fee £3 3s. 0d. (Men only).

OCTOBER

Cardiology	Oct. 7 to Oct. 18—National Hospital for Diseases of the Heart. All day. Fee £7 7s. 0d. (limited to 20).
Ophthalmology	Oct. 7 to Nov. 2—Central London Ophthalmic Hospital. Afternoons. Fee £3 3s. 0d.
Tropical Medicine	Oct. 8 to Oct. 31—London School of Hygiene and Tropical Medicine. Tues. and Thursday afternoons. Fee £2 2s. 0d.
Gynaecology	Oct. 4 to Oct. 26—Chelsea Hospital for Women. Mornings and/or afternoons. Fee £5 5s. 0d.
Diseases of the Throat, Nose and Ear	Oct. 14 to Nov. 2—Central London Throat, Nose and Ear Hospital. All day. Fee £5 5s. 0d. (Practical Operative Class £7 7s. 0d.) (Endoscopy and Pathology Classes).
Neurology	Oct./Nov.—The National Hospital, Queen Sq. (8 weeks).

NOVEMBER

Ante-Natal	Nov. 1 to Nov. 22—Royal Free Hospital. Fridays at 5.0 p.m. Fee £1 1s. 0d. (limited to 10).
Medicine, Surgery, and Gynaecology	Nov. 4 to Nov. 23—Royal Waterloo Hospital. Afternoons and some mornings. Fee £3 3s. 0d.
Veneral Diseases	Nov. 4 to Nov. 30—London Lock Hospital. Afternoons and evenings. Fee £2 2s. 0d.
Neurology	Nov. 18 to Dec. 13—West End Hospital for Nervous Diseases. Daily 5 p.m. Fee £2 2s. 0d.
Proctology	Nov. 25 to Nov. 30—St. Mark's Hospital. All day. Fee £3 3s. 0d.
Orthopaedics	Nov. 18 to Nov. 30—Royal National Orthopaedic Hospital. All day. Fee £3 3s. 0d.

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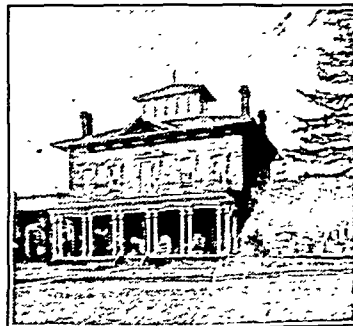
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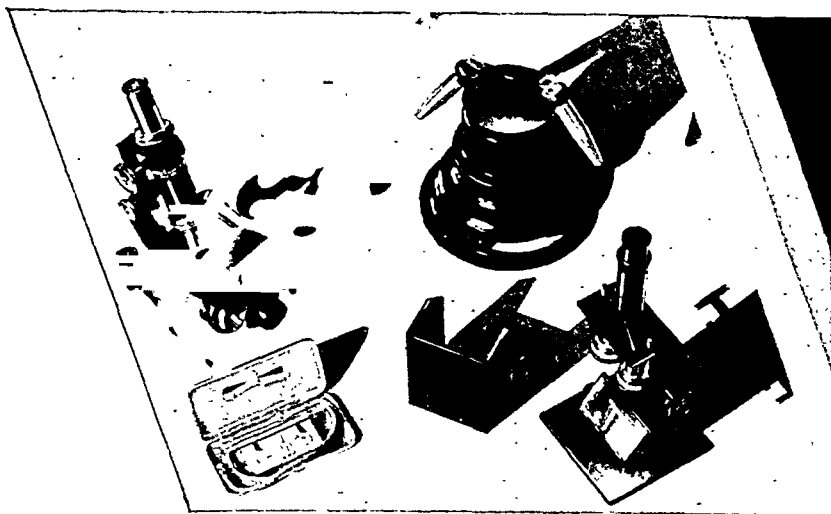
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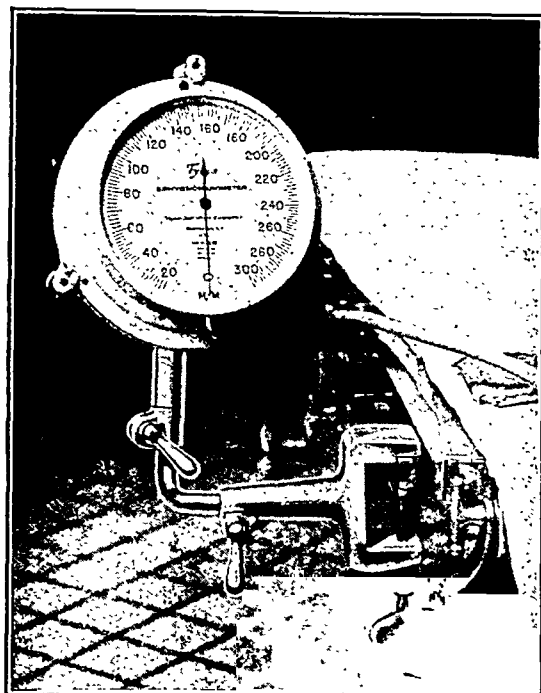
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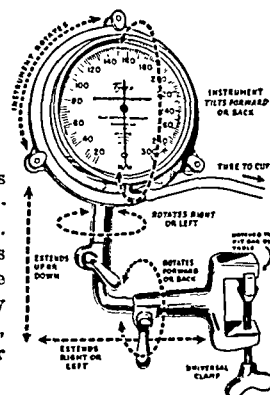
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MILWAUKEE

March 25, 1929.

Victor X-Ray Corporation

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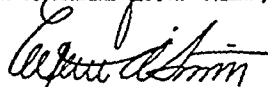
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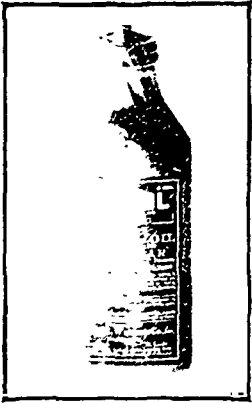
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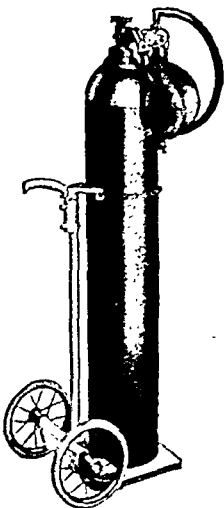
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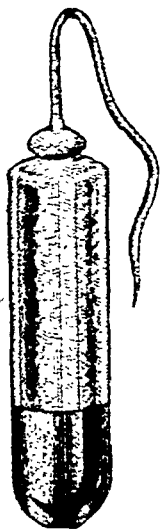
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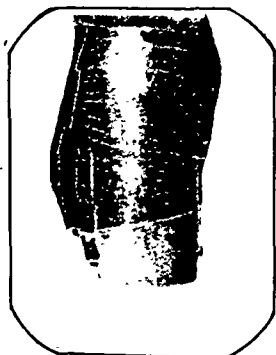
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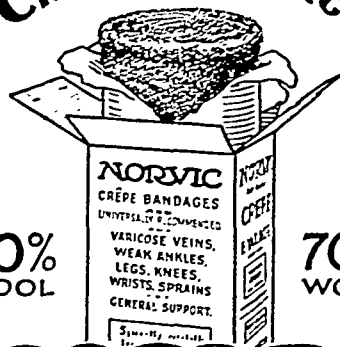
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(Continued on page liv)



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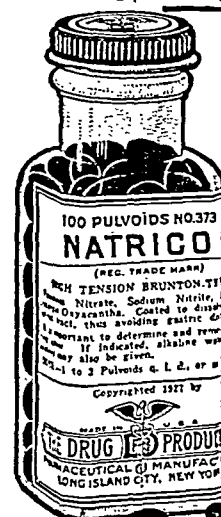
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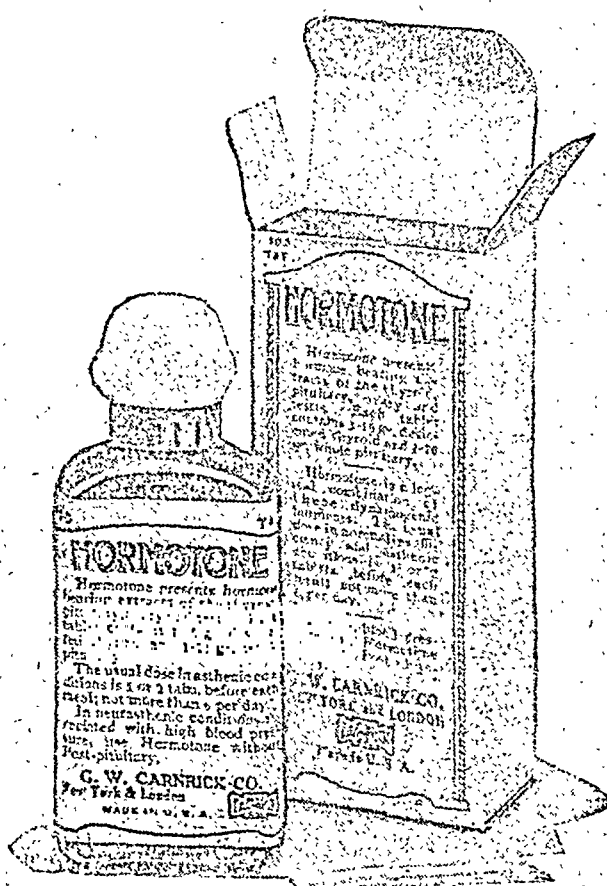
(Continued from page lii)

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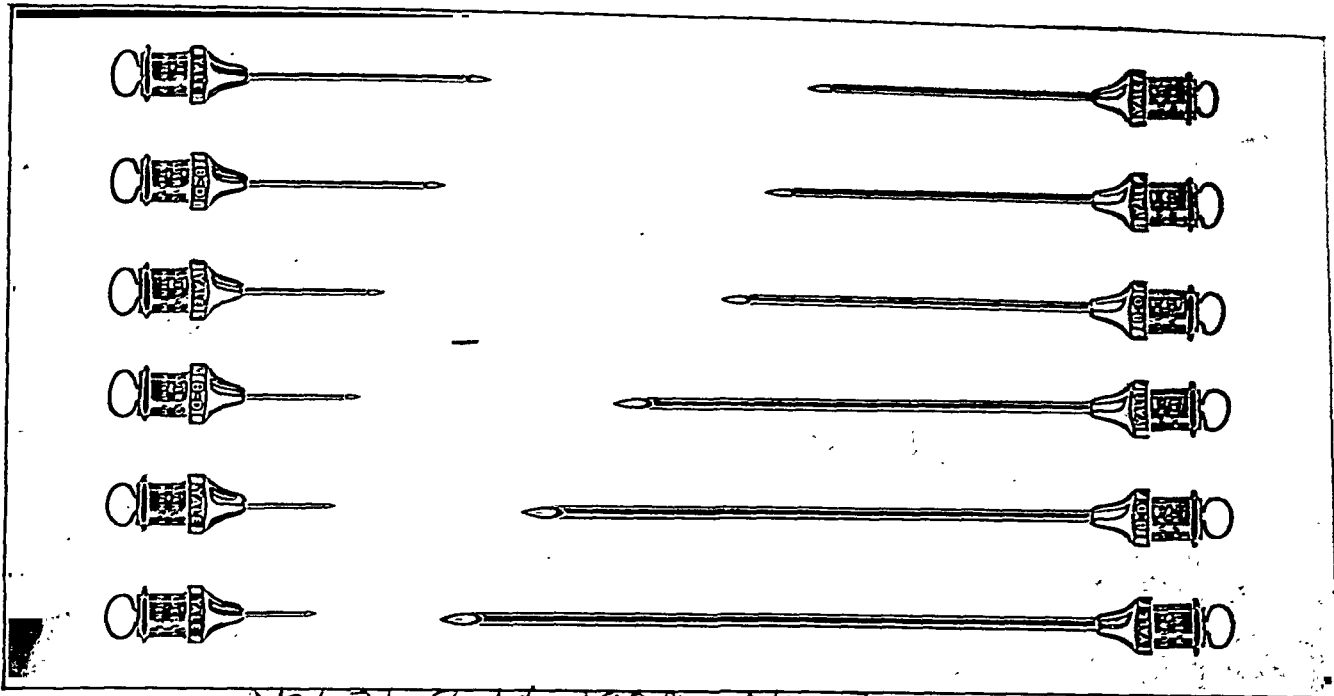
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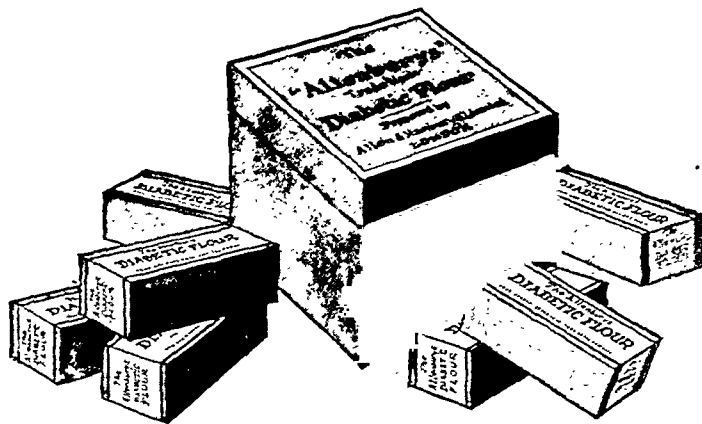
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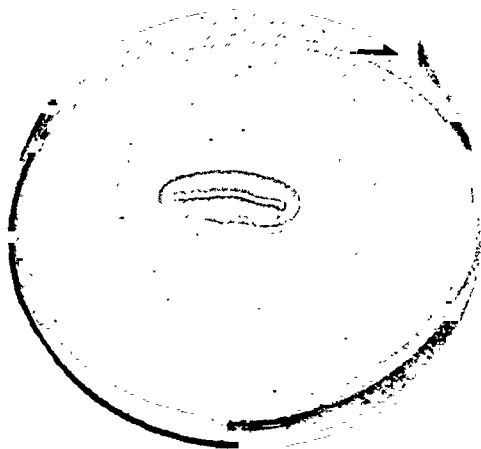
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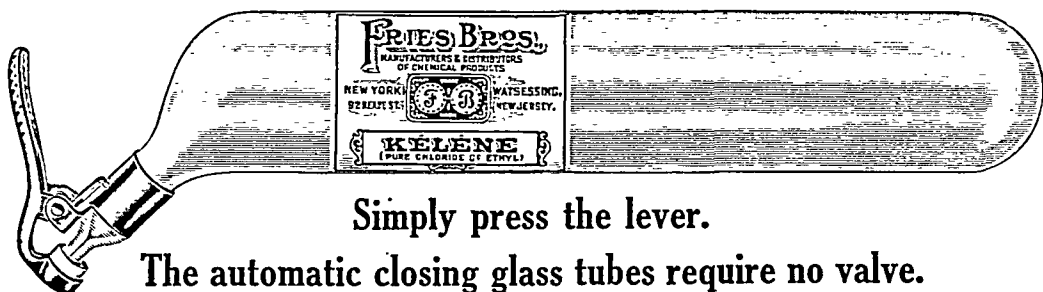
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The Association

BUSINESS REPORT OF THE SIXTIETH ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION, WINDSOR HOTEL, MONTREAL

June 17, 18, 19, 20, 21, 1929

THE sixtieth annual meeting of the Canadian Medical Association was held in the Windsor Hotel, Montreal, June 17-21, 1929.

The first meeting of Council was held at ten o'clock on the morning of Monday, June 17th, continuing throughout the day and also the following day.

The following members of Council answered to the roll call during the course of the different sessions:—

Dr. J. D. Adamson - - - - -	Winnipeg	Dr. W. S. Lyman - - - - -	Ottawa
Dr. G. H. Agnew - - - - -	Toronto	Dr. C. F. Martin - - - - -	Montreal
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Dr. L. J. Austin - - - - -	Kingston	Dr. A. F. Menzies - - - - -	Morden
Dr. Gordon Bates - - - - -	Toronto	Dr. W. W. Merritt - - - - -	Calgary
Dr. A. T. Bazin - - - - -	Montreal	Dr. Ross Millar - - - - -	Ottawa
Dr. E. J. Boardman - - - - -	Winnipeg	Dr. Ross Mitchell - - - - -	Winnipeg
Dr. B. Bourgeois - - - - -	Montreal	Dr. B. Mooney - - - - -	Edmonton
Dr. W. B. Burnett - - - - -	Vancouver	Dr. J. H. Mullin - - - - -	Hamilton
Dr. G. C. Cameron - - - - -	Toronto	Dr. H. H. Murphy - - - - -	Kamloops
Dr. G. S. Cameron - - - - -	Peterborough	Dr. A. R. Myers - - - - -	Moncton
Dr. Murdoch Chisholm - - - - -	Halifax	Dr. J. G. MacDougall - - - - -	Halifax
Dr. J. R. Corston - - - - -	Halifax	Dr. J. S. McEachern - - - - -	Calgary
Dr. G. R. Cruikshank - - - - -	Windsor	Dr. A. McPhedran - - - - -	Toronto
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		Dr. Ward Woolner - - - - -	Ayr
		Dr. A. MacG. Young - - - - -	Saskatoon
		Dr. Geo. S. Young - - - - -	Toronto
		Mr. J. A. Cairns-Forsyth - - - - -	London, Eng.
		Sir StClair Thomson - - - - -	London, Eng.

Dr. A. Primrose, Chairman of Council, welcomed the representatives to the first session of that body and also expressed regret at the passing of two past-presidents and well known members of the profession, in the persons of Dr. F. J. Shepherd of Montreal, a life member of the Association, and Dr. Chas. Sheard of Toronto.

A cordial welcome was extended to Mr. J. A. Cairns-Forsyth and Sir StClair Thomson of London, England, official fraternal delegates from the British Medical Association; also to Professor E. Rist of Paris, France, and Dr. Nutting Fraser of St. John's, Nfld.

REPORT OF THE COMMITTEE ON PERSONAL ARCHIVES

The members of Council remained standing while the General Secretary presented the report of the Committee on Personal Archives.

Mr. Chairman and Members of Council:—

Your Committee on Personal Archives report, with regret, the loss by death of forty-one members of the Association during the past year.

Those whom we record are:—

Dr. W. H. Alexander, Toronto
 Dr. F. J. Ball, Regina
 Dr. Jos. Bascom, Toronto (Life Member)
 Dr. R. J. Blanchard, Winnipeg, (Life Member)
 Dr. A. M. Burgess, Bala
 Dr. H. M. Cameron, Winnipeg
 Dr. A. C. Campbell, St. Thomas
 Dr. N. Culbertson, White Horse, Yukon
 Dr. W. A. M. Dinwoody, Toronto
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 Dr. R. A. Masson, Montreal
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 Dr. J. R. McLean, Sault Ste. Marie
 Dr. R. B. Nevitt, Toronto
 Dr. L. P. Normand, Three Rivers
 Dr. W. D. Rankin, Woodstock, N.B.
 Dr. D. W. Ross, Fredericton
 Dr. M. M. Seymour, Regina
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 Dr. F. J. Shepherd, Montreal (Life Member)
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 Dr. D. T. Smith, Ottawa
 Dr. H. R. Smith, Edmonton
 Dr. C. L. Starr, Toronto
 Dr. W. G. Stewart, Montreal
 Dr. M. T. Sullivan, Glace Bay
 Dr. A. Turner, St. Thomas
 Dr. W. J. Weaver, Niagara Falls
 Dr. A. R. B. Williamson, Kingston

Respectfully submitted.

Approved.

C. F. WYLDE,
Chairman.

REPORT OF THE EXECUTIVE COMMITTEE

It was agreed that this report should be dealt with clause by clause.

Mr. Chairman and Members of Council:—

Due to the fact that we have in the Association such a large number of active Committees whose reports are presented herewith, it remains for your Executive Committee to report but briefly upon our work of the past year.

1.—THE ANNUAL MEETING, 1928

The most notable feature of the year 1928, was the annual meeting which was held last June in the little City of Charlottetown. Although it may be invidious to make distinctions from year to year, with regard to our various meetings, yet your Executive Committee feels confident that the membership at large would desire us to make reference to the very excellent meeting which our hosts of last year, though very few in number, were able to arrange. The Charlottetown meeting will long be remembered as one of the most delightful in our history.

Approved.

2.—THE ANNUAL MEETING, 1929

Immediately following the close of our annual meeting last year, the President-Elect, Dr. A. T. Bazin of Montreal, began to make preparations for the meeting of this year. The organization which the President-Elect gathered about himself has functioned throughout the year most efficiently. The program which has been prepared, together with the careful planning which has been necessary for the various functions and pastimes associated with the meeting, have all been carried out most thoroughly. Council will no doubt desire to express its appreciation to the Montreal Committee for what we are confident will prove to be one of the best meetings we have ever held.

Approved.

3.—COMMITTEES

At the conclusion of our meeting last year, the Executive Committee appointed the standing and special Committees of the year. The principle of zoning standing Committees by appointing a group of seven men resident in one area as a nucleus of the Committee was continued. Additional members were added to each Committee at the pleasure of the nucleus. By scattering our various committees throughout Canada, interest in the affairs of the Association has been broadened in a manner which we believe to be of distinct advantage to organized medicine. We recommend that the principle of zoning Committees, which was established in 1926, be continued.

Approved.

4.—COLLECTION OF FEES

At our last annual meeting, Council authorized the collection of fees to be undertaken in the autumn, preceding the calendar year for which the fees are due. We desire to report that throughout the autumn months of 1928, members were advised of this change of policy, and on the whole, the plan, although not put into actual operation until close upon the end of the year, gave every indication of being received with approval by the greater majority of our members. Within the course of the next two or three years, it should be possible to have practically all of our fees in hand at the beginning of the year, and thus avoid carrying, on our *Journal* mailing list, any appreciable number of arrears who represent a definite financial loss to the Association if the fees are ultimately unpaid.

Approved.

5.—MEETING OF BRITISH MEDICAL ASSOCIATION, WINNIPEG, 1930

Members of Council will be glad to know that plans for the meeting of next year, although not far advanced at this date, continue to develop and expand. Under the direction of our nominee for the position of President of the British Medical Association, Dr. W. Harvey Smith of Winnipeg, a very active Committee has been quietly at work for more than a year. It is expected that, immediately following the Manchester meeting of the British Medical Association, attention will be directed to the Winnipeg meeting, and that developments from that time on, will be rapid and interesting.

Approved.

In speaking to this section of the Report, Dr. Harvey Smith reported that the work of preparing for the meeting of the B.M.A. in Winnipeg was progressing very satisfactorily. He urged the members of Council to do all in their power to have a good representation from their respective districts at the Winnipeg meeting.

RE FINANCES—B.M.A.—WINNIPEG MEETING

It was agreed that the sum of \$2,000 should be placed at the disposal of the Winnipeg Committee, as a drawing fund, to meet expenses connected with the 1930 B.M.A. Meeting; and that the Executive Committee of the C.M.A. should be empowered to add to this amount, from time to time, as necessity arises.

6.—OFFICIAL FRATERNAL DELEGATES

Council will be pleased to learn that the British Medical Association has appointed as official fraternal delegates to our annual meeting this year, Sir St. Clair Thomson and Mr. J. A. Cairns-Forsyth; and, to the British Medical Association meeting to be held in Manchester, your Executive Committee has been pleased to appoint the following official fraternal delegates:

Dr. W. Harvey Smith, Winnipeg.
Dr. A. T. Bazin, Montreal.
Dr. A. Primrose, Toronto.
Dr. G. S. Fahrni, Winnipeg.
Dr. H. S. Birkett, Montreal.
Dr. E. W. Archibald, Montreal.
Dr. J. G. FitzGerald, Toronto.
Dr. Geo. A. Ramsay, London.

Approved.

7.—PERIODIC PHYSICAL EXAMINATIONS

During the past year, several conferences have been held between the Public Health Committee of the Canadian Life Insurance Officers Association and representatives of your Executive Committee. Last November, the General Secretary was invited to address the annual meeting of the Life Insurance Officers Association, when the proposed plan for periodic health examinations was discussed at some length. A number of factors have prevented the plan being brought to fruition. This does not mean, however, that a practical working out of the idea is impossible. The General Secretary will present for the consideration of Council, proposed details of procedure.

In speaking to this section of the report, the General Secretary advised Council that arrangements have been completed with the Life Insurance Officers Association of Canada,

whereby the Canadian Medical Association will become the clearing house for periodic health examinations of policy holders in Canada, the whole plan to be put into operation on January 1, 1930. The General Secretary also submitted a number of form letters to policy holders and to physicians, which have been prepared in connection with the carrying out of the plan outlined. A manual and form were also submitted, which were prepared by a Committee of the Canadian Medical Association, and printed and distributed by the Department of Health, Canada, to every Doctor in the Dominion, dealing with the carrying out of complete physical examinations.

In speaking to this report, Dr. Geo. A. Ramsay called attention to the excellent service rendered by Dr. Angus Graham, and Dr. J. T. Bowman of London, and Mr. E. E. Reid of the London Life Insurance Company, in connection with plans for the carrying out of the procedure.

Members of Council were urged to do their utmost, when the plan is put into operation, to ensure its success.

8.—THE SUN LIFE ASSURANCE COMPANY OF CANADA

During the past year, we received from the Sun Life Assurance Company, the sum of \$45,000—\$30,000 for the Department of Post Graduate Medical Education, and \$15,000 for the Department of Hospital Service. We are pleased to be able to report that a like sum has been voted us by the Company for the current year. This brings the total amount granted us by the Sun Life, during the last four years, up to the magnificent sum of \$150,000. Council will no doubt desire again to express its thanks, on behalf of our members throughout Canada, to our benefactors for their wonderful support.

Approved.

9.—ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

At time of going to press, the Bill authorizing the formation of the Royal College of Physicians and Surgeons of Canada has passed its third reading in the House of Commons, and is now before the Senate. The report of the Nucleus Committee of Charter Fellows who are responsible for this Bill, will be found herein, together with a copy of the Bill. The Committee is deserving of the commendation of Council for having brought this matter to a successful issue.

It was agreed that this section should be received, and discussion deferred until the Report of the Committee on Royal College of Physicians and Surgeons of Canada was dealt with.

10.—ROYAL COLLEGE OF SURGEONS OF ENGLAND

The Committee in charge of negotiations which have been going on for the past several years between the Royal College of Surgeons of England and this Association, are to be congratulated on having completed arrangements with the Royal College to hold the Primary Examinations.

ination in Canada in the month of August next. Details of the arrangement will be found in the report of the Committee. This will be the first time in the history of the Royal College that its examinations have been held outside the British Isles.

It was agreed that this Section should be received, and discussion deferred until the Report of the Committee on Royal College of Surgeons of England is dealt with.

11.—DEPARTMENT OF HEALTH EDUCATION

Council will learn with pleasure that the Canadian Life Insurance Officers Association has seen fit to make us a grant of \$6,000 to finance the Department of Health Education for the ensuing year.

Several members of Council expressed their appreciation of this generous grant from the Canadian Life Insurance Officers Association.

12.—PROVINCIAL CO-OPERATION

Travelling teams of speakers were utilized during the past year to visit in sequence many of the provinces. This plan which has been in operation for several years has proved successful from many points of view, not the least of which has been the possibility of bringing the provinces more closely together in their medical activities. Plans have already been arranged for groups of speakers to visit the Provincial Associations in both the East and the West, following our annual meeting this year.

Approved.

13.—APPLICATIONS FOR MEMBERSHIP

During the past year, 146 applications for membership have been received by the General Secretary. The list will be submitted to Council for ratification at this meeting.

It was agreed that the list of applications for membership should be passed to Dr. L. J. Austin, Chairman of the Committee on Credentials and Ethics, to be reported upon at a later meeting of Council. At a later session of Council, Dr. Austin reported as follows:—

The Committee, having carefully reviewed the list of applicants, would suggest that,—

2 applicants be refused membership in the Canadian Medical Association, one being found unsuitable, and one not registered in his own province.

9 applicants could not be vouched for. It was suggested that information in reference to these be secured from the provincial Associations.

The remaining 140 applicants were accepted for membership in the Canadian Medical Association.

14.—CONCLUSION

The year 1928, in the opinion of your Executive Committee has been a most successful one. Interest in our activities and in our membership has been sustained.

In closing we desire to express our sincere thanks to the many Committees and individual members who have so whole-heartedly assisted in carrying on our work during the past year.

All of which is respectfully submitted.

T. C. ROUTLEY,
General Secretary.

Approved.

The Report of the Executive Committee, as a whole, was approved.

CORRESPONDENCE

Re The Prince of Wales

The Secretary reported that an invitation had been extended to His Royal Highness, The Prince of Wales, to visit Winnipeg, during the course of the British Medical Association Winnipeg meeting, in August, 1930.

The General Secretary was instructed to cable birthday greetings to the Prince of Wales.

The following cable was, later, dispatched to His Royal Highness:—

“Canadian Medical Association in sixtieth annual session assembled at Montreal, desires to extend to Your Royal Highness heartiest birthday greetings.”

On June 24th, the following reply was received from the Private Secretary to the Prince of Wales:—

“Please convey to members Canadian Medical Association Prince of Wales’ sincere thanks for their kind birthday greetings.”

INTERNATIONAL COUNCIL OF NURSES

The General Secretary presented a letter of greeting to the Canadian Medical Association from the International Council of Nurses.

The General Secretary was instructed to communicate with the International Council of Nurses, reciprocating their kind greetings.

REGRETS

Telegrams expressing regret at inability to be present were read from Dr. S. Moore, Regina, Dr. D. S. Johnstone, Regina, Dr. G. F. Dewar, Charlottetown, Dr. Murray MacLaren, Saint John, Dr. John Ferguson, Toronto, and Dr. David Low, Regina.

REPORT OF CENTRAL PROGRAM COMMITTEE

Mr. Chairman and Members of Council:—

The work of this Committee has been made delightfully easy through the indefatigable efforts of the Montreal organization in charge of the Annual Meeting. The excellent and elaborate program of the scientific sessions is entirely due to their activity. The Central Program Committee extends both its thanks and congratulations.

All of which is respectfully submitted.

GEORGE S. YOUNG,
Chairman.

Approved.

REPORT OF THE HONORARY- TREASURER

Mr. Chairman and Members of Council:—

The audited statement of Messrs. Clarkson, McDonald, Currie and Company for 1928 which is appended, shows our excess revenue for the year to be \$3,236.10, bringing our total surplus account to \$28,278.00.

Revenue from advertising amounted to \$29,797.34, exceeding that of 1927 by \$2,199.38. Revenue from membership fees and subscriptions amounting to \$30,474.73 shows a decrease of \$1,358.30, but as this is, to a large extent, dependent upon the place of annual meeting, it is a good showing for 1928 when the meeting was held in a small centre.

Total expenses exceeded those of 1927 by \$5,495.30.

Owing to the steady increase in special Trust Funds the audited financial statements have been changed in form and these Funds are listed separately on Schedule No. 1 and No. 2.

Assets, consisting of Cash, Accounts Receivable, Investments and Trust Funds amount to \$68,801.13.

Liabilities including Accounts Payable and Prepaid, Balance of Appropriation to Editorial Board, Prepaid Subscriptions 1929, and Trust Funds, total, \$40,523.13.

INVESTMENTS AND BANK INTEREST

Investments made from time to time from the General Fund total, \$24,793.79, and in 1928 yielded interest to the amount of \$983.66. Bank interest amounted to \$337.22, a total of \$1,320.88. On our Current Account the rate of bank interest is 2½ per cent on the minimum monthly balance, less \$1,500.00 free.

ANNUAL MEETING, 1928

Receipts from the commercial exhibits at the 1928 annual meeting amounted to \$2,270.00. The total expenses were \$1,645.76, leaving a net balance of \$624.24.

TRAVELLING EXPENSES EXECUTIVE COMMITTEE

According to the new ruling made by Executive Committee last year these expenses are now payable in full, provided that the total sum for one year does not exceed \$1,000.00. From January to December, 1928, the expenses totalled, \$382.32.

COLLEGE OF PHYSICIANS AND SURGEONS

Of the \$1,000.00 authorized by Council in 1927 as a loan for organization expenses, the Treasurer has been called upon, to date, to make payments as follows:—

Apr. 23, 1928, Expenses of Committee to Special Meeting, Ottawa.....	\$111.20
Feb. 5, 1929, Legal Fees as authorized by Executive Committee.....	200.00
Feb. 28, 1929, Special Fees.....	159.00
	<hr/>
	\$470.20

SPECIAL FUNDS

Post-Graduate Fund.

A summary of expenses according to the audited statement of Mr. J. H. Dignam has been incorporated in "Trust Fund, Schedule No. 1 and No. 2," of our financial statement.

Hospital Service Fund.

A detailed statement of the expenses of this Department is also included in "Trust Fund, Schedule No. 1 and No. 2," of the official statement.

Department of Publicity and Health Education.

The sum of \$2,000.00—a grant from the Ontario Medical Association—was placed at the disposal of this Department in January, 1928, and a statement of the year's expenses as reported by the General Secretary and audited by Mr. J. H. Dignam, is as follows:—

By

Grant from Ontario Medical Association.... \$2,000.00

To

Clerical Assistance.....	\$ 871.00
Travelling Expenses.....	254.15
Postage.....	98.95
General Expense.....	48.05
	<hr/>
	\$1,272.15
Balance on hand represented by Furniture and Equipment..	\$116.15
Cash in Bank, December 31, 1928	611.70
	<hr/>
	\$2,000.00

On February 19, 1929, a cheque for \$600.00 was issued in favour of the Department in accordance with a Resolution of Executive Committee October 20, 1928, that further sums be made available for the financing of the Department until such time as a grant is secured from some other source.

Lister Club Trust Fund.

At a meeting of the Finance Committee, December 13th last, the question was discussed of reinvesting interest and compound interest which has accumulated since the Second Listerian Oration in 1927. A decision was made in the negative as it was felt that the time was too short to make such a step worth while. This revenue will be required in 1930 in connection with the Third Listerian Oration.

SUMMARY AS ON DECEMBER 31ST, 1928

By

Capital.....	\$5,030.41
Interest and Compound Interest	376.06
	<hr/>
	\$5,406.47

To Investments:

\$4,000 City of Winnipeg, 5/43 at \$100.50; Yield, 4.96%.....	\$4,021.20
\$900 Dom. of Canada, 4½/40 at \$98.45; Yield, 4.66%.....	886.05
\$100 Dom. of Canada 4½/40 at \$99.50; Yield, 4.56%.....	99.50
	<hr/>
	\$5,006.75
Cash in Bank December 31, 1928	399.72
	<hr/>
	\$5,406.47

Osler Memorial Fund.

The total sum received up to December 31st, 1928, from the Chairman of the Committee was \$3,325.00, and the Fund stands as follows:—

By

Capital December 31st, 1928....	\$3,325.00
Revenue from Investments and Bank Interest.....	80.43
	<hr/>
	\$3,405.43

Many references were made by members of Council to the splendid financial position in which the Association finds itself.

REPORT OF THE EDITOR

Mr. Chairman and Members of Council:—

In presenting the report of the Editor for the past year I desire first to express the thanks and deep indebtedness of the Editorial staff to the many contributors who have enabled the *Journal* to maintain a high reputation as the official organ of Canadian medicine. During the past year papers of much practical and scientific interest have been contributed by members of the profession in every province of the Dominion. Research work of importance has appeared in nearly every monthly issue; the long list of original papers appearing in each number has maintained a high standard and has kept the general reader well abreast of advancing knowledge, while articles written specially on subjects of practical interest to the practitioner have appeared almost every month. We believe the *Journal* throughout the year has had a welcome reception from the profession in every province and in distant portions of the Empire.

Owing to the increasing size of each monthly issue the twelve numbers when bound together made an unwieldy volume, therefore, those of last year were divided into two volumes each with a separate index, thus adding greatly to the ease of handling and of reference.

As our universities hold an important place in all professional activities, it appeared desirable to apportion a special page in our monthly issue to news regarding their several medical faculties, and to any special activities carried on by their staffs. This was begun in the January issue, and will be continued regularly through each number.

It is to be remembered that as yet we form a comparatively small society of workers, and in consequence our published activities are apt to be greatly overshadowed by the researches and publications of institutions to the south of us. It is, therefore, very important that papers representing research work carried on in our own country should receive prompt and full recognition. The *Canadian Medical Association Journal*, as long as it is the official journal of the Association, should be able to announce all research work carried on in our Dominion, and to publish, at least, an abstract of all important papers written by Canadians. In this way our *Journal* will contain a record of Canadian work, and will be valuable for reference. This has been one of the aims of the *Journal* during the years I have been associated with it.

The year 1919, following the Great War, was a year of general reorganization and rehabilitation. The previous five years had proved sad and most trying to all. Both our Association and our *Journal* had suffered greatly during the strain. With the necessary reorganization a new Editorial Board was appointed, and the task laid before it was a heavy one. Our Association at that time was deeply in debt; groups of medical men throughout its widely separated provinces had few binding ties, as communications were only imperfectly opened up, and on the leaders of the profession was placed the task of creating a united medical Canada. Looking back, I think we can say that in that work the *Journal* has played an important part. The thanks of our Association today are due not only to the *Journal* but to its many contributors who helped in the work, and especially to the Chairman and members of the several Provincial Boards, who from the beginning have given unreservedly, and without thought of reward, much self-denying labour in collecting papers and news of interest, thus greatly assisting the Central Editorial Board. Among those demanding especial mention are Dr. Hattie in Halifax, Dr. Ross Mitchell in Winnipeg, Dr. Learmonth in Calgary, and Dr. Gwyn in Toronto; all of whom, from the time of their first appointment have supported in a most altruistic way our efforts to place our Association

Journal in the highest rank and make it of the greatest usefulness. Many others might be mentioned who also in a most disinterested way have responded time and again to urgent calls for "copy." Looking back on these ten years of office, permit me to express again my deep appreciation of all the assistance rendered by our contributors and associates. To them is due the fact that your official *Journal* is a credit to your Association.

Gentlemen, after these remarks regarding the past, I place in your hands, with much regret, my resignation from the office of Editor. During the past year my part in the task of editorship has, unfortunately, had many breaks. In addition to the three months' leave of absence, which was kindly granted to me by your Executive Committee last summer, I contracted an attack of pneumonia a few weeks after my return to duty in August, and nearly another two months elapsed before I was able to resume the full duties of Editor. Once again, during the month of March this year, I found it necessary to relinquish my duties for a few weeks for a visit to the temperate air of the south. I am glad to state that during all these absences the work of editorship was ably carried on by my associate, Dr. Nicholls and my assistant, Dr. MacDermot. Owing to lack of strength due to advancing years, I feel quite unfit for the strain of work and responsibility which the editorship demands. During the past ten years the *Journal* has kept me, with few intermissions, at my desk till far into the night many nights of the week. To me, however, it has been a labour of love. It has been my desire that work in connection with the *Journal* should be regarded as willingly carried on for the Association. I feel now, however, that my resignation is necessary. Before severing my connections with the editorial staff permit me, once again, to thank Dr. Nicholls, and Dr. MacDermot for their able and kindly assistance during the past year. I desire also to thank yourself, Mr. President, who, as our Managing Editor, has with excellent judgment brought the *Journal* through many difficulties; also the members of our Editorial Board who have not hesitated to devote time and thought to the many problems of editorial work. Especially are my thanks due to a few contributors who, at my personal request, have undertaken the preparation of articles involving much labour.

In now resigning from the post of Editor it is my hope that health and strength may permit me occasionally to wield a free lance and contribute from time to time to the pages of the *Journal*. It would be to me impossible to lose all interest in its success.

All of which is respectfully submitted.

A. D. BLACKADER,
Editor.

Approved.

In the absence of Dr. Blackader through illness, Dr. Bazin presented the Report of the Editor.

The members of Council expressed their keen regret to learn of Dr. Blackader's illness and also that he has decided to resign from the position which he has held so successfully for many years, as Editor-in-Chief of the *Journal*. A Committee composed of Drs. J. G. FitzGerald, H. H. Murphy, T. G. Hamilton, W. S. Lyman and J. S. McEachern, with Dr. A. T. Bazin as convener, was appointed to deal with this matter.

At a later session of Council, this Committee brought in the following report:—

"Members of Council have learned with regret of the resignation of Doctor A. D. Blackader as

Editor of the *Canadian Medical Association Journal*. During Dr. Blackader's tenure of office, covering a period of ten years, the quality of the *Journal*, the sphere of its influence and the character of the service it has rendered, have all been a source of pride and satisfaction to every one interested in the welfare of the medical profession in the Dominion of Canada. As a tangible expression of deep and abiding appreciation of Dr. Blackader's efforts, as a mark of recognition, also, of his eighty-second birthday, and, finally, to signalize his pioneer and long-sustained interest in the field of diseases of children and his devotion to the highest ideals in medicine, it is recommended to Council that there be established in the Canadian Medical Association the Blackader Lecture in Diseases of Children.

It is also recommended that an endeavour be made to secure by subscription, the sum of five thousand dollars, to endow the proposed lectureship, and that the income on the capital sum be applied once in every three years to provide an honorarium for, and to defray the expenses of, a distinguished worker in the field of pædiatrics, who would be invited to deliver the proposed Blackader Lecture. The above resolution was moved by Dr. FitzGerald, seconded by Dr. Hamilton, and carried unanimously.

Dr. Bazin particularly requested that he be given the privilege of acting as Chairman of the special Committee appointed to deal with this trust fund. To this, Council readily and unanimously assented.

OFFICERS FOR 1929-30

The following were elected by Council to act on the Nominating Committee:—

Dr. B. Mooney	- - - - -	Edmonton
Dr. E. A. McQuade	- - - - -	Trenton
Dr. C. J. Veniot	- - - - -	Bathurst
Dr. C. F. Martin	- - - - -	Montreal
Dr. Léon Gérin-Lajoie	- - - - -	Montreal
Dr. J. D. Adamson	- - - - -	Winnipeg
Dr. J. J. Roy	- - - - -	Sydney
Dr. J. G. MacDougall	- - - - -	Halifax
Dr. B. Bourgeois	- - - - -	Montreal
Dr. T. Glen Hamilton	- - - - -	Winnipeg
Dr. J. S. McEachern	- - - - -	Calgary

The nominating Committee met at 4.30 p.m. on Monday, June 17th.

At the Tuesday morning session of Council, the Committee presented the following list of officers, who were then elected by Council:—

President	- - - -	Dr. A. T. Bazin, Montreal
President Elect	- -	Dr. W. Harvey Smith, Winnipeg
Honorary Treasurer	-	Dr. Frank S. Patch, Montreal
Chairman of Council	-	Dr. A. Primrose, Toronto
General Secretary	- -	Dr. T. C. Routley, Toronto

EXECUTIVE COMMITTEE

Dr. L. J. Austin	- - - - -	Kingston
Dr. J. G. FitzGerald	- - - - -	Toronto
Dr. Léon Gérin-Lajoie	- - - - -	Montreal
Dr. T. G. Hamilton	- - - - -	Winnipeg
Dr. J. C. Meakins	- - - - -	Montreal
Dr. J. G. MacDougall	- - - - -	Halifax
Dr. J. S. McEachern	- - - - -	Calgary
Dr. F. N. G. Starr	- - - - -	Toronto
Dr. C. J. Veniot	- - - - -	Bathurst
Dr. Geo. S. Young	- - - - -	Toronto

PLACE OF MEETING—1930

It was agreed that the Canadian Medical Association will meet conjointly with the British Medical Association in Winnipeg, August 26th to 29th, 1930; also, that Council will meet in Winnipeg for the transaction of business on Friday and Saturday, August 22nd and 23rd, with an additional session, if necessary, on Monday, August 25th.

REPORT OF THE MANAGING EDITOR

Mr. Chairman and Members of Council:—

During the past year the issues of the *Journal* have been of the same size and standard as during the previous year, and any deviation from the now well established working plan has not been found necessary.

Two questions were raised by the Executive Committee at the last annual meeting: The postage payable on *Journals*, and the quality of paper in the advertising section.

POSTAGE RATES ON JOURNAL

The opinion was expressed that a cheaper rate might be obtained on the basis of the subscription price being \$5.00. Inquiry has elicited the information that the amount of the subscription has no bearing on the postage payable. The *Journals* are mailed in bulk as second class matter and the scale of prices is as follows:

Canada, excluding Toronto, 1½ cents per pound;
Toronto city, 1 cent for four ounces or fraction;
United States, 1 cent for four ounces or fraction;
Foreign countries, 2 cents per 2 ounces or fraction.

QUALITY OF PAPER IN ADVERTISING SECTION

The question of a cheaper paper has been studied and the following reasons are advanced as detrimental to such a policy:

The cuts used by advertisers would not reproduce satisfactorily and would show a shadow on the reverse side of the page.

The advertisers do not look upon such a policy with favour and it would be detrimental to the obtaining and maintaining of contracts.

It would detract from the appearance of the *Journal*. It was tried out some years ago and found inadvisable.

COPYRIGHTING OF THE JOURNAL

The *Journal* is now duly copyrighted under the Copyright Act of 1921. A statement to that effect has appeared on the cover since November 1928. The copyright fee was \$2.00 plus a registration fee of \$1.00.

FILLERS'

The Editorial Board has considered the pros and cons of the fillers now used on the lower section of a page when an article does not completely fill a page. While it was felt that they should not be dispensed with, a change in the type from 10 point to the smaller 8 point was approved. The change was initiated with the new volume (July 1928 issue).

EXCHANGE JOURNALS

The exchange list has been thoroughly revised with a threefold object. (1) That in addition to the publications in the English language, we receive at least one important *Journal* from every leading foreign country. (2) That all publications we receive may serve as a library to our Department of Abstracts. (3) Where it was felt to be of distinct advantage to have our *Journal* on the files and in the libraries of the exchanging parties.

COMPLIMENTARY LIST

This also received careful revision and now includes the nine libraries of the Canadian medical schools, and the University of British Columbia; the reading rooms, where such exist, of the Medical Undergraduate Societies—eight in all; the Principals of the Medical Schools; officers of the British Medical Association; and the publishing houses supplying books for review.

APPOINTMENTS PROVINCIAL EDITORIAL BOARDS

Chairmen of Provincial Editorial Boards as appointed by the Provincial Medical Associations at their last Annual Meetings are as follows:

Alberta	G. E. Learmonth
British Columbia	C. H. Bastin
Manitoba	Ross Mitchell
New Brunswick	A. S. Kirkland
Nova Scotia	W. H. Hattie
Ontario	N. B. Gwyn
Prince Edward Island	J. W. McKenzie
Saskatchewan	Lillian Chase.

ADVERTISING

Our advertising section is steadily increasing and I have pleasure in reporting it to be on a very sound footing. The year 1928 shows an increase over the previous year of \$2,199.38. There have been no bad debts recorded in this Department for two consecutive years.

PROPOSED INDEX

The question of getting out a complete index for the first 20 volumes of the *Journal*, from January 1911 to June 1928, at a cost of \$3,000 has been before the Executive Committee at previous meetings and was approved by Council at Charlottetown, contingent upon Executive Committee authorizing the necessary funds. The matter was tabled.

After further and careful study of the question it has been found that it would be advisable and a very definite advantage if the index, instead of 20, would cover 10 volumes only. The cost, based on 5,000 copies with covers, inclusive of postage and mailing envelopes would be between \$1,500 and \$2,000; which amounts to .40 cents per copy.

A 10 year index would have the additional advantage of covering the period when the *Journal* was of the smaller size.

In considering the matter Council's attention is directed to the fact that indices covering a period of years, usually 10, are issued by all leading *Journals*. A good index is of inestimable value to libraries and similar

institutions, yet it is not in their interests only that we bespeak such a publication, but in the interests of our members. Lack of space for storing back *Journals* or lack of library facilities are no handicap if an index covering several years is on file. It is perhaps not fully recognized what an asset it would be if members of the profession whose library facilities are inadequate or who for want of space cannot file *Journals*, would have on their shelves complete indices of several leading publications. The letters received in an Editorial office regretting the writers' inability to search the literature bear out these facts. A ten year index would be a step in the right direction.

EDITORIAL BOARD ACCOUNT

The appropriation of the Editorial Board in 1928 was \$10,000, and there was a balance carried forward on January 1st of \$4,117.19. On December 31st the Department was credited with \$185.25 being interest at 4½ per cent on the unexpended balance of \$3,717.49. The year's appropriation, however, was insufficient to meet expenditure by the amount of \$584.95. This is accounted for by the fact that a regular salary has been paid to the Associate Editor.

The following is an itemized statement:

Balance carried forward	
January 1, 1928.....	\$ 4,117.19
Appropriation for 1928....	10,000.00
Interest on \$3,717.49 to	
December 31, 1928...	185.25
	<u>\$14,302.44</u>

Disbursements

Salary Associate Editor....	\$6,000.00
Honorarium to Editor....	1,800.00
Salary, Assistant Editor....	1,200.00
Honorarium to Chairmen	
Prov. Editorial Boards.	\$35.00
Contributions to Depart-	
ment of Abstracts.....	467.50
Special Correspondents....	\$245.15
Miscellaneous.....	37.30
	<u> </u>
Balance carried forward,	
December, 31, 1928....	\$3,717.49
	<u>\$14,302.44</u>

All of which is respectfully submitted.

ALFRED T. BAZIN,

Managing-Editor.

Approved.

REPORT OF THE COMMITTEE
ON ETHICS

Mr. Chairman and Members of Council:—

The Nucleus Committee at Kingston met several times to consider the following letter received from the British Medical Association *re* the administration of anaesthetics, in response to a request made by the Section of Anaesthesia of the Canadian Medical Association that this information be secured:—

London, England.

March 16th, 1928.

Dear Doctor Routley:

The reply to your letter of February 29th, in which you ask for information as to the policy laid down by the Association in regard to the administration of anaesthetics is contained in the following resolutions passed by the Representative Body:

(1) "That no person other than a registered medical practitioner should administer any anaesthetic for medical or surgical purposes, except that a registered dentist who has received special instruction in the administration of anaesthetics may administer anaesthetics for dental purposes only;

(2) That where a general anæsthetic is administered it is undesirable that any person should act both as operator and administrator in the same case where this can be avoided, but it must be recognized that cases occur in practice in which this responsibility may justifiably be undertaken."

The origin of these resolutions is as follows:—

In 1910 the Association gave evidence before a Departmental Committee on coroners law, etc., and in this evidence our views were expressed as to how we thought the administration of anæsthetics should be dealt with. The resolutions I have quoted were modified in 1927 because a new situation has arisen since 1910, as many dentists are now instructed in the administration of anæsthetics and are in the habit of administering them.

So far as administration of anæsthetics is concerned, the matter has not been touched by the legislature so that it cannot be said that our resolutions make it illegal for nurses or anyone else to give general anæsthetics. They merely express an opinion as to what is desirable.

Yours faithfully,

(Signed) Alfred Cox.

Medical Secretary.

After deliberation, it was decided to seek further information from the various Provinces of the Dominion. A Questionnaire was circulated from the Association office, to which replies were obtained from six of the nine provinces. On analysis of the replies received, your Committee finds:—

(1) In most Provinces, the Medical Acts regulate the administration of anæsthetics.

(2) Nurses are trained and paid to give anæsthetics in certain parts of the Provinces of Quebec and New Brunswick.

(3) Undergraduates do not give anæsthetics except under close supervision in medical schools.

(4) Dental surgeons administer gas and oxygen, and local anæsthetics after due training.

(5) Irregular practitioners are not known to give anæsthetics.

Your Committee, therefore, finds that, at present, the public and the profession are well guarded in the matter of the administration of anæsthetics. The question of trained nurses giving anæsthetics is one that is becoming of increasing importance, and should receive consideration by the Association.

No other problems have been submitted to the Committee on Ethics during the last year.

All of which is respectfully submitted.

L. J. AUSTIN,

Chairman.

Approved.

Considerable discussion arose with reference to the question of nurses being allowed to give anæsthetics.

The question was asked, "What protection is given a registered nurse who gives an anæsthetic?" The reply was to the effect that, where nurses are allowed to give anæsthetics, the surgeon assumes the dual responsibility, in the majority of cases.

In Nova Scotia, nurses are allowed to give anæsthetics, but the hospital board takes the responsibility.

The following points were brought out in the discussion:—

In the Red Cross Hospitals of Northern

Ontario the rule is that, if a physician can be secured, no nurse shall give an anæsthetic.

In New Brunswick, it is contrary to law for a dentist to administer either ether or chloroform.

In St. Boniface Hospital, Winnipeg, it has been decided that nurses shall not give anæsthetics.

In Montreal General Hospital, for years, a medical man has been in charge of the Department of Anæsthesia, with trained anæsthetist nurses acting as his assistants; and a very satisfactory service is maintained.

It was finally decided that the Department of Hospital Service of the Canadian Medical Association should be asked to secure from the various hospitals in Canada, information as to the administration of anæsthetics by nurses, with a view to preparing statistics for presentation to Council next year.

REPORT OF THE COMMITTEE ON INTRA-CANADIAN RELATIONS

Mr. Chairman and Members of Council:—

The report of your Committee for this past year is short. It was felt that a strong appeal to the profession by letter for support of the Canadian Medical Association should be tried out and a draft was sent to the General Secretary, Dr. Routley, with the request that he re-write the same and send it out from his office. This he did and at the same time published the letter in the *Journal*. What total results there will be your Committee does not attempt to guess; however we are glad to note that to date 144 applications for membership were received by the General Secretary.

Your Committee feels that the provinces should again be urged to appoint full time medical men as Field Secretaries, who would also act as the Associate Secretaries of the Canadian Medical Association. It would be the duty of each appointee to get into personal touch with the practitioners, thereby bringing directly to each physician the reasons why he should be an active supporter of the Canadian Medical Association.

All of which is respectfully submitted.

J. S. WRIGHT,

Chairman.

Approved.

Some discussion followed with reference to the matter of increasing membership in the Canadian Medical Association, and all those present evinced a strong desire to evolve some plan of securing additional members for the Association. The following points were emphasized:—

We should first build up our local and Provincial Medical Societies, and then persuade our local members to join the Canadian Medical Association.

Post Graduate meetings in unorganized districts often aid in organization.

A good live field secretary, who could devote his time to visiting the profession in the different provinces, would be of great assistance in creating interest in the Canadian Medical Association. Personal contact will accomplish more than writing letters.

Each member of Council should endeavour to secure Canadian Medical Association members in his own community.

Younger men might be assisted in the payment of the membership fee, until they are financially able to do so themselves.

We should endeavour at all times to create in the minds of our colleagues a healthy, kindly, sympathetic feeling towards organized medicine.

REPORT OF THE COMMITTEE ON PUBLICITY AND HEALTH EDUCATION AND PUBLIC HEALTH

Mr. Chairman and Members of Council:—

At the annual meeting of the Association held in Charlottetown last year, the Committee on Publicity and Health Education and the Committee on Public Health were merged. At the same time it was suggested that the Committee on Periodic Health Examinations, the original duties of which had largely been discharged, might also be incorporated in the new combined committee. The members of this Committee are:—

Dr. J. G. FitzGerald, *Chairman*, Toronto
Dr. Gordon Bates, Toronto.
Dr. J. L. Biggar, Toronto.
Dr. G. D. Porter, Toronto.
Dr. Geo. A. Ramsay, London.
Dr. A. Grant Fleming, Montreal.
Dr. C. F. Martin, Montreal.

Several meetings of the Committee have been held during the year. Special meetings of the Chairman, the General Secretary and the Director of the Health Service Department with members of the Canadian Life Insurance Officers Association have also taken place. As a result of representations made, a group of Canadian Life Insurance Companies have undertaken to provide the sum of \$6,000 for the support of the work of the Health Service Department for the year 1929-1930. I should like to emphasize the fact that the members of the Public Health Committee of the Life Insurance Officers Association have given most freely and generously of their time in efforts to find means whereby the Canadian Medical Association might, with the financial support of Canadian life companies, still further extend the service at present rendered the general public, as well as the medical profession, throughout the Dominion of Canada.

The weekly Health Service articles have been continued in 173 newspapers published in the various provinces. The number of papers in each of the nine provinces using these articles is shown hereunder:—

Prince Edward Island	2
Nova Scotia	6
New Brunswick	8
Quebec	9
Ontario	69
Manitoba	16
Saskatchewan	26
Alberta	21
British Columbia	14

Six of the papers are French language newspapers. The estimated total circulation of the newspapers to which the Health Service articles are supplied is 1,350,919. The articles are supplied free. That there is a very widespread and lively interest in this work is evidenced by the fact that there have been received between July 1st, 1928 and May 1st, 1929, 432 letters of enquiry. Questions as to diagnosis and treatment are, of course, not answered but in such cases correspondents are referred to their family doctor.

Dr. A. Grant Fleming has continued to direct the work of the Health Service and the Association is again deeply indebted to Dr. Fleming for the splendid work he has done without any remuneration whatsoever. Miss McCrory, also, for several months gave gratuitous service which was very valuable and is much appreciated.

The generous benefactions which certain of the Canadian life insurance companies have promised to make will permit of the organization of the Health Service Department upon a somewhat different basis for the year 1929-30.

A great deal of consideration has been given by members of the Committee to the question of the functions and activities of the various voluntary health promoting agencies in Canada. A conference was to have been held in Ottawa in May 1929 to which the Association was asked to send two representatives. The conference was postponed until a later date when the Deputy Minister of the Department of Pensions and National Health was instructed to proceed abroad prior to the dates upon which the meetings were to have been held. The conference was to have been held under theegis of the Department of Pensions and National Health, hence the postponement for the above reason. A survey of the activities of these voluntary health agencies would probably have been made available to the Association in the published proceedings of the conference. With that in mind, your Committee did not commence a study of the lay voluntary health promoting agencies, which task your Executive has suggested might be undertaken.

In addition to a study of the voluntary health agencies, a survey of the question of health insurance should at some convenient time be undertaken. This latter task might to advantage be performed in conjunction with other agencies, official and voluntary, interested in the question. The medical profession through the medium of the Canadian Medical Association has here an opportunity to provide leadership in the study of a social question of paramount interest and importance.

The film which has been prepared, illustrating procedures in the conduct of periodic health examinations, will be shown at the annual meeting. Dr. C. F. Martin, Chairman of the Committee on Periodic Health Examination and Dr. A. Grant Fleming have carried through to completion an arduous undertaking which has been very time consuming and beset with technical difficulties. The film should be a valuable auxiliary in familiarizing practitioners with the technique of such examinations.

For several reasons which need not here be detailed, there has been a delay in bringing to fruition the plan outlined by the General Secretary last year for the conduct of periodic health examinations by physicians in conjunction with the Canadian Medical Association and certain of the life insurance companies. Conferences with a group of representatives of these companies have been held and your General Secretary addressed the annual meeting of the Canadian Life Insurance Officers Association upon the subject in November 1928. It is hoped that progress will be made in the development of this plan during the coming year.

The subject of maternal mortality in Canada, a question of great public interest, has received the earnest consideration of a special committee composed of Dr. George S. Young (Chairman), Dr. W. B. Hendry and Dr. Helen MacMurchy.

All of which is respectfully submitted.

J. G. FITZGERALD,
Chairman.

Approved.

Dr. FitzGerald called attention to the fact that a grant of \$6,000 has been secured from a group of Canadian Life Insurance Companies for the work of the Health Service Department for the year 1929-1930.

REPORT OF THE COMMITTEE ON LEGISLATION

Mr. Chairman and Members of Council:—

On behalf of the Legislative Committee I wish to state that the Manitoba nucleus met during the past season on three occasions, but felt that the Committee had made very little progress during the past two years, although many meetings and a good deal of time was devoted to the work by local members of the Committee.

In last year's report we pointed out that there were several other special committees dealing with legislative matters, and our Committee had not been advised of this fact and in some instances at least was duplicating the work. For instance, last year practically our whole season, including many meetings, was devoted to bringing about one common examination for medical licensure across the whole of Canada. With this in view we wrote to the Registrar of the College of Physicians and Surgeons in each province, and also to the medical faculty of each university, and in most instances received very generous and promising replies. We had hoped this year to bring about further advances and recommend to your Council some definite plans for the advancement of this project. We were in communication with the Medical Council of Great Britain and were endeavouring to draw up our recommendations somewhat at least along the same lines as exist in Great Britain.

When we convened again this year we found this whole question was being handled by the Medical Services of Canada during the same period, and that the educational institutions concerned were represented on this body. We felt then that our previous year's work was pretty well wasted, and that it would be wise to proceed no further until a more definite understanding of our scope was arrived at.

The Committee felt that any work we attempt to do would have to be carried out in close co-operation with the Central Office. It seemed to be the general feeling of the meeting that the questions for solution should be given to us by the Central Office of the Association, and in this way we would avoid the mistakes of the past.

All of which is respectfully submitted.

G. S. FAHRNI.

Chairman.

Approved.

RE OVERLAPPING OF COMMITTEES

As pointed out in the foregoing report, there has been some overlapping in the work of a few of the standing committees of the Association. It was suggested that, if Council would delineate to each standing Committee the special work to be undertaken, it would assist the Chairmen very materially.

It was finally agreed that a sub-committee composed of Doctors V. E. Henderson, Geo. A. Ramsay, Ross Mitchell, F. W. Routley and H. H. Murphy be appointed to look into this matter and report to a later session of Council.

At a later session of Council, Dr. Henderson

presented the following report of his sub-committee:—

“As a premise to defining the duties of Committees, the following statements should be made:—

(a) Each standing Committee of the Canadian Medical Association shall serve as a compiling and recording committee for the reports of the standing committees of the various Provincial Associations having the same duties.

(b) Special committees should be appointed through one of the standing committees, and the duties of such special committees should be indicated by the standing committee involved; and this standing committee should indicate when the duties of special committees may be terminated.

In regard to the Standing Committees:—

Ethics—to be known as Ethics and Credentials—duties to indicate that Ethics has to do with ethical relations of members in their professional practice.

Intra-Canadian Relationships—to be named Committee on Inter-Provincial Relationships. The duties should be to promote greater interest by Provincial Associations in the welfare of the Canadian Medical Association, and to take cognizance of any problem arising from the action of any Provincial Association, affecting beneficially or adversely other Provincial Associations or the Canadian Medical Association. Further, to pass in review the new developments in Provincial Associations, and report to all Provincial Associations valuable developments occurring in any one province.

Public Health—to deal with (a) health publicity; (b) health education; (c) health legislation, i.e., legislation by provincial and federal governments dealing with preventive medicine.

Legislation—to deal with legislation arising in and proposed by

(a) Licensing bodies.

(b) Provincial or Federal Governments affecting the profession save as indicated under Public Health and Pharmacy.

(c) Any proposal in regard to such legislation contemplated by any other Canadian Medical Association Committee. For this purpose the Committee should be notified by the Chairman of other

Canadian Medical Association Committees of any legislative proposals to be made by his committee; and such Chairmen and the Secretaries of Provincial Associations and of the Canadian Medical Association should notify the Chairman of the Legislation Committee of any changes in Provincial or Federal Statutes affecting the medical profession.

Economics—to deal with—

- (a) Health Insurance.
- (b) Remuneration and employment of physicians by lay bodies, hospitals or Governments—federal or provincial.
- (c) The supply of physicians.

Medical Education—as it stands,—but attention is called to the fact that any changes proposed in methods of licensure should be dealt with jointly by this committee and that of Legislation.

Post-Graduate—to be a standing committee.

Medical Survey—to be a special committee if thought advisable by Economics.

Mariners Committee—to be a special committee.

Municipal Physicians—to be a special committee.

Pharmacy—to deal with matters arising out of—

- (a) Food and Drugs Act.
- (b) Opium and Narcotic Drug Act.
- (c) Patent and Proprietary Medicine Act.
- (d) Pharmacopœia and Canadiana.
- (e) Prescriptions and new drugs.

Constitution and By-Laws—a standing committee.

Advisory Committee to Department of Hospital Service—duties to be defined."

The report of the Sub-Committee, as stated above, was approved for consideration by the Executive Committee.

At the meeting of the Executive Committee on Wednesday, June 19th, after careful consideration of the above report, it was agreed that Dr. J. C. Meakins be appointed convener of a committee, with power to add, to make a careful study of the report, and report to a subsequent meeting of the Executive Committee.

REPORT OF THE COMMITTEE ON MUNICIPAL PHYSICIANS

Mr. Chairman and Members of Council:—

Communications from the various members of this Committee were to the effect that nothing new has developed in the Provinces in the way of Legislation.

In British Columbia a Committee was appointed by the Government at the last Session to make inquiry into the matter of proposed changes in the Acts relating to the Medical Profession. In the west, at least, it would seem that public opinion is increasingly strong for some changes in the application of medicine to public health, and soon other western Governments will be taking action as well as British Columbia.

In Alberta arrangements are being made for the appointment of a few women physicians to meet the need for medical service in some of the far outlying districts remote from hospital and medical service. These physicians will be appointed and paid by the Provincial Department of Health, their transportation in the District to be provided by those requiring the services of the physician and housing accommodation to be provided by the district.

It would appear wise for the Canadian Medical Association to step out and act on the suggestion of last year's report and urge a Commission to study the whole question, over a period of years if necessary, for it is certain if the West moves seriously in this matter, the East will soon follow and we shall be in a position of having all at once to accept undesirable legislation, whereas, if we take steps to interpret the mind and wishes of the public, we will be able to suggest the legislation most desirable and best suited for the needs of all.

All of which is respectfully submitted.

D. S. JOHNSTONE,
Chairman.

Approved.

It was agreed that discussion of the report of the Committee on Municipal Physicians should be deferred until the Report of the Committee on Economics was being considered, inasmuch as the two reports overlap to a certain extent.

The report of the Committee on Municipal Physicians was later adopted.

RE MISLEADING ADVERTISING OF COMMERCIAL FIRMS

Correspondence received from a certain advertising agency complaining of misleading advertising appearing in the press, was referred to the Chairman of the Committee on Ethics for study and report.

At a later session of Council, Dr. Austin recommended that this matter be referred to the incoming Committee on Ethics for further consideration. Council agreed to this proposal.

ASSOCIATION PROFESSIONNELLE INTERNATIONALE DES MEDECINS

The Association Professionnelle Internationale Des Medecins had its origin in London, Eng., in July, 1925, when representatives of the Medical Associations of Sweden, Denmark, Norway, Hol-

land, and France met there to celebrate the opening of the new building of the British Medical Association. One year later, in July, 1926, the Association was definitely organized at a meeting in Paris, France, to which the National Medical Associations throughout the world were invited to send representatives. Since that time, both the British Medical Association and the American Medical Association have joined the organization, and it has the endorsement of twenty-five nations of the world.

The objects of the A.P.I.M. are to constitute a national bureau of information and liaison between the National Groups of the medical profession, so that each may profit by the experience of the others, and that they may study together various professional problems concerning the life and work of the medical practitioner. Questions purely scientific are not dealt with.

Correspondence was presented to Council from the Secretary of the A.P.I.M. and also from the Secretary of the British Medical Association, urging the Canadian Medical Association to join the A.P.I.M. This was passed, for study and report, to a committee composed of Drs. P. Z. Rheume, Léon Gérin-Lajoie, J. G. FitzGerald, and J. Stevenson.

At a later session of Council, the above-mentioned Committee presented the following recommendation:—

“That the C.M.A. join the A.P.I.M., and that, if Council approve this recommendation, it be passed to the Executive Committee for the necessary action.”

Council approved of the recommendation of the special committee, as stated above, and, at the meeting of the Executive Committee on Wednesday, June 19th, the General Secretary was instructed to take the necessary action.

RE FIELD SECRETARIES

A file of correspondence reference the appointment of Field Secretaries in the various provinces was passed to Dr. G. Stewart Cameron for study and report.

At a later session of Council, Dr. Cameron presented the following resolution, which was approved:—

“That this Association approves of the principle of the appointment of Field Secretaries, but believes that the demand should come from the Provincial Associations.”

RE NOMENCLATURE OF DISEASES AND OPERATIONS

A copy of “Nomenclature of Diseases and Operations, and Manual of the Medical Record”, by T. R. Ponton, was referred to Council for an expression of opinion as to the advisability of having it adopted in Canada. The matter was referred to Dr. V. E. Henderson, Chairman of the Committee on Pharmacy for study and report.

At a later session of Council, Dr. Henderson recommended that the matter be passed to the Executive Committee, with the suggestion that a joint Committee of the Canadian Medical Association and the Federal Bureau of Statistics and Health, look into the matter.

It was pointed out by a member of Council that the International Nomenclature of Causes of Death is being revised in Paris this year, and any nomenclature adopted for use in Canada would need to conform with the approved International Nomenclature.

At the meeting of the Executive Committee on Wednesday, June 19th, it was agreed that the Advisory Committee of the Department of Hospital Service be asked to make a study of this nomenclature, and report to the Executive Committee at a later date.

RE IODIZED SALT

A communication from the Canadian Chemical Association asking for the co-operation of the Canadian Medical Association in an investigation into the use, optimum iodine content and control of iodized salts in Canada, was passed to Dr. V. E. Henderson, Chairman of the Committee on Pharmacy, for study and report. Dr. Henderson recommended that the Executive Committee of the Canadian Medical Association approach the National Research Council with the request that they establish a committee to investigate the use, optimum iodine content, and control of iodized salt, with the recommendation to the National Research Council that the Canadian Medical Association Executive Committee nominate certain medical representatives on the Committee.

At the meeting of the Executive Committee on June 19th, it was agreed that this matter be passed to the Committee on Pharmacy for study and report.

RE OPIUM AND NARCOTIC DRUG ACT .

With reference to the Act to amend and consolidate the Opium and Narcotic Drug Act, Dr. V. E. Henderson reported that several objectionable features were removed from the Bill, owing to representations made by the Canadian Medical Association, through Dr. A. MacG. Young. Council expressed appreciation of Dr. Young's assistance in this matter.

Dr. Young stated that all the doctors in the House had been very active in connection with this matter.

RE RADIO-ACTIVE WATER

A communication from the Department of Pensions and National Health, Ottawa, stated that the Department would be willing to co-operate with the Canadian Medical Association in an investigation of the radio-active content of certain waters, the Department furnishing all the information available to them which would assist in such investigation.

It was suggested by Dr. Henderson, Chairman of the Committee on Pharmacy, that the National Research Council and the Department of Health set up a committee to make an investigation of radio-active waters and that the Canadian Medical Association appoint representatives on this Committee, which should also contain a number of physicists. The Committee, when appointed, should prepare an authoritative statement on the efficacy of radio-active waters as a means of treating disease, and, further, report on the strength of the radio-active springs in Canada.

It was agreed that this suggestion should be passed to the Executive Committee for action.

At the meeting of the Executive Committee on June 19th, the above mentioned matter was brought up for consideration, and it was agreed that it be passed to the Committee on Pharmacy for study and report.

REPORT OF COMMITTEE ON
PHARMACY

Mr. Chairman and Members of Council:—

Several circular letters have gone out to the members of the Committee this year and the response has been much more satisfactory than in years past. The matters dealt with are as follows:

1. A questionnaire in regard to the use of the Pharmacopœial ointments to determine in which cases a paraffin base is essential and the frequency with which the various B.P. ointments are used. The information was most valuable to the Canadian Committee on Pharma-

ceutical Standards which has now completed a long (18 page) statement on behalf of Canada for the Pharmacopœial Commission which is undertaking the compilation of the new edition of the British Pharmacopœia. The objections raised by Canada to the nature of the proposed revising body has after a long inquiry led to the formation of this Commission and to setting up definite rules for its guidance. The work of the Canadian Medical Association Committee on Pharmacy has borne fruit.

2. Representations were made in regard to proposed changes in the Opium and Narcotic Drug Act. Thanks to the activity of Dr. A. MacG. Young, M.P., of Saskatoon, one of the objectionable features of the proposed bill is likely to be removed.

3. The Committee on Pharmacy has undertaken to co-operate with the Division of Hospital Service in the compilation of a hospital pharmacopœia, which will serve as a guide to prescribing in the smaller hospitals. This work is now under way.

4. The Secretary of the Canadian Medical Association turned over to the Committee on Pharmacy for an expression of opinion the following case:—

A thoroughly reputable Canadian Pharmaceutical House which handles Cod Liver Oil has found that its sales are being adversely affected by the magazine advertising of certain American firms. They point out that Cod Liver Oil is not a drug in the narrower sense of the word but is a food on account of its vitamin content; consequently, they consider also undertaking advertising in the non-medical or lay press. They advertise largely in the *Association Journal*. They are anxious to do nothing which may be considered by the medical profession as unethical, as they value their connection with physicians. They have therefore proposed to the Association that they submit to the Association the copies of any advertising material in the lay press and undertake not to publish any advertisement to which the Association objects on account of its containing statements which might be taken as intended to mislead the public or to interfere with normal practice by the physician. They would wish however, as an indication that the organized profession did not consider such advertising an infringement of professional ethics, to be allowed to place in small type a statement something of this character; "The wording of this advertisement has been approved by the Canadian Medical Association and is considered by them to be ethical." (This is simply a wording which has been formulated and suggested. The exact wording would have to be carefully thought over.)

The comments on this letter have ranged from approval to strong disapproval. Most members feel that the public will fail to differentiate between approval of the wording of the advertisement and recommendation of the product. This latter the Association could not undertake until it has laboratory facilities at its disposal. This is a real difficulty but I am in possession of an advertisement appearing in the *Hospital Magazine* of a Sunshine Lamp which contains words indicating the approval of the Council of the American Medical Association of the ethical character of the advertisement.

It was pointed out that such scrutiny of advertising in the lay press would inevitably establish a stricter rule than that now imposed by the *Canadian Medical Association Journal*.

There was no intention that such policy of scrutinizing and passing on advertisements should be applied to drugs proper but only to such substances which might be regarded as foods.

The amount of work which would be implied by the adoption of such a policy was pointed out and also the delicacy of judgment which would be required and the possibility of friction which would arise.

An expression of opinion from Council is requested.

5. The Canadian Committee on Pharmaceutical Standards is making progress in the compilation of a Canadian Formulary which it is hoped will be of value to both physicians and pharmacists.

All of which is respectfully submitted.

VELYIEN E. HENDERSON,
Chairman.

Approved.

Following the Report of the Committee on Pharmacy, considerable discussion ensued with reference to Clause 4 of the report, relating to advertising by reputable Canadian Pharmaceutical Houses. It was the general feeling that our Canadian Pharmaceutical Houses were not given a fair chance against American firms, although the product placed on the market by them is of equal value, at least, to the American product. The members felt that some method should be adopted by the Canadian Medical Association to assist Canadian firms who are endeavouring to render good service.

Finally, it was agreed that we recommend to the Executive Committee that they consider adopting the policy of giving an expression of their approval to ethical advertising in the lay press, of foods (including vitamin containing substances) and light and electrical apparatus, by allowing a statement to be published with each advertisement, similar to the following:—"The Canadian Medical Association considers that there are no unduly exaggerated claims made in this advertisement."

At their meeting on June 19th, the Executive Committee considered the above mentioned matter very carefully, and it was decided that the matter be referred to the Committee on Pharmacy and the Committee on Public Health, for a joint report.

The Executive Committee expressed themselves as willing to approve of the Pharmaceutical Houses mentioned placing ethical advertisements in the lay press; but they did not feel that the Association should attach any statement regarding the claims made in such advertisements when the Canadian Medical Association has no laboratory in which to make the necessary tests.

REPORT OF THE COMMITTEE ON ECONOMICS

In the absence of Dr. MacDermot of Vancouver, Dr. H. H. Murphy of Kamloops presented the report of the Committee on Economics.

Mr. Chairman and Members of Council:—

The Committee on Economics has no very outstanding matters to report, beyond the fact that Health Insurance has now become an active issue in the British Columbia Legislature. A Committee of five members of the House has been appointed, which includes two medical men, Drs. Borden and Gillis. This Commission has

started its work, which, of course, at first will necessarily be preparatory. We are keeping a close watch on the situation, which may develop suddenly at any time. It may be advisable for the Council of the Canadian Medical Association to take part in our meetings with the Legislature.

Through Dr. Prowd's special Committee on Marine Hospitals, a valuable report was rendered during the year to the Council, and appeared in the Report of Transactions. There has not been much change in this matter in British Columbia, but we should strive for fairer apportionment of the work and a more adequate scale of remuneration to the doctors concerned, as well as the abolition of the plan by which doctors' work is included in the hospital fee.

It will be of interest to the parent Association to know that the British Columbia Medical Association has been able, during this session of the Legislature, to obtain considerable improvement in the status of coroners, and the pay obtained by them and their surgeons for inquests and autopsies. Improvement in this was long overdue, but the British Columbia Government has behaved with fairness and justice in remedying the state of affairs that has existed for so long.

This association has also made a very complete survey of medical contracts throughout the province, and this should form the nucleus of a similar Dominion-wide survey, with a view to obtaining data for Health Insurance if this should materialize.

All of which is respectfully submitted.

J. H. MacDERMOT,

Chairman.

In speaking to this report, Dr. Murphy stated that existing conditions in the Province of British Columbia seem to point towards the necessity for some form of Health Insurance in that province.

As an amendment to this report, it was decided that the last sentence in the first paragraph should be changed to read as follows:—

"It may be advisable for representatives of the Council of the Canadian Medical Association to take part in our meetings with the Legislature."

A lengthy discussion ensued with reference to this report, including also the report of the Committee on Municipal Physicians, in so far as they both relate to some form of State Medicine.

At this point, the General Secretary presented the following resolution to Council, at the request of the Ontario Medical Association:—

"The Ontario Medical Association requests the parent Association, the Canadian Medical Association, to assume the responsibility of petitioning the Federal Government to appoint a suitable commission with wide judicial powers to study the problem exhaustively, in order to ascertain whether adequate and satisfactory medical service, both preventive and curative, is within the reach of all persons in need thereof; to learn whether the present volume of sickness with its attendant economic loss may be lessened; if so, to suggest ways by which this might be achieved; to study the remedies already introduced elsewhere for the alleviation of analogous conditions, and, finally, to bring forward specific recommendations to the proper bodies, govern-

ment and voluntary, so that appropriate action might be taken."

Considerable time was spent in the consideration of health insurance and state medicine, as affecting the various provinces of Canada. The following points were emphasized:—

The Association should take the initiative in exploring the work they would be called upon to do if any such plan should be introduced into any province of Canada. We should become familiar with all aspects of the question, particularly as it relates to the service that doctors will be called upon to provide.

It is desirable that we perfect the organization of the profession until we have at least 90 per cent of the members in local organizations and in the Canadian Medical Association, so that it would be possible for us to take united action, and, in a constructive fashion, co-operate with the authorities in any province in laying plans for health insurance.

Each province has a problem entirely its own. In Saskatchewan the difficulty lies in getting medical service at the outlying points of the province. British Columbia and Manitoba have entirely different problems. Are we prepared, in Canada, to adopt a plan of State Medicine? It would be well to consider carefully just what that would involve before entering into any line of procedure which might tend to invite State Medicine.

Under the British North America Act, the adoption of any form of health insurance would come under the jurisdiction of the provincial governments.

To ask the Government to appoint a commission to study this question would indicate, on our part, a certain amount of approval of the system. We should move very carefully, and, whatever we do, should be done independently of any Government. We should become informed as to what is going on, and be prepared, if the legislators do push this, to come forward with a satisfactory working arrangement so far as the medical profession is concerned. As an Association, we should be prepared to get behind it and direct it, if it does come. If we are not prepared to take the lead, we will be forced to submit to whatever arrangement may be made.

It is our duty to strengthen our organization to the highest degree, and to be thoroughly informed on all aspects of state medicine and health insurance.

We are not called upon to initiate Government schemes, but it is incumbent upon us to find out what is taking place and to be prepared to meet the situation with a view to public safety and public health, and, at the same time, prevent our profession from being thrown into chaos as happened in Great Britain.

The following resolution was finally passed:—

"That we recommend to the Association that some one be appointed to make a careful study of the whole question of state medicine, and report to the proper committee, which, in turn, will report to the next annual meeting; and that such appointee shall devote, if necessary, his whole time to this study, his remuneration and expenses to be fixed by the Executive Committee."

The above mentioned matter was carefully considered by the Executive Committee at their meeting on June 19th. The Committee felt that we should have before us all available information reference state medicine as it exists throughout the world, including opinions from medical men and lay people. It was also felt that it would not be an easy matter to find the right man for this work; but, in order that progress might be made, it was agreed that the General Secretary should secure all possible information, with copies sufficient to supply each member of the Executive Committee,—in order that a study may be made of this material; and that, as soon as seems feasible, a suitable man be engaged to complete the survey."

FEE SPLITTING

Certain correspondence was brought to the attention of Council, dealing with the question of fee-splitting. The suggestion was made that the Committee on Ethics be asked to draft a suitable pledge to be used as a basis for the mobilization of the whole profession of Canada against the practice.

REPORT OF THE COMMITTEE ON MEDICAL EDUCATION

Mr. Chairman and Members of Council:—

The introduction of conjoint examinations between Canadian Universities, Provincial Medical Councils or Boards and the Medical Council of Canada was proposed at the Second Conference of the Medical Services in Canada held at Ottawa in March, 1927, and this conference recommended "that the feasibility of holding a conjoint examination between the Medical Council of Canada, the Provincial Medical Councils and the Canadian Universities be given consideration by each of the bodies concerned."

The results of consideration of this conjoint examination indicated that the Universities were in its favour; that some of the Provincial Councils were in favour and

some expressed a view that conditions were not yet ready for it.

OPINIONS OF PROVINCIAL COUNCILS ON CONJOINT EXAMINATION

Nova Scotia:

None received.

New Brunswick:

Oct. 2nd, 1928—"In the opinion of this Council, the question of conjoint examinations between the Medical Council of Canada, the Provincial Medical Council and the Canadian University is good in principle."

Quebec:

None received.

Ontario:

July 7th, 1928—"As there are so many practical difficulties entailed in such conjoint examinations, it is not recommended."

Manitoba:

Oct. 18th, 1928—"That we, as a body, are quite in sympathy with the principle of conjoint examinations and are ready to co-operate in negotiation and action towards that end."

Saskatchewan:

July 30th, 1928—"That the Council is not prepared to accept the resolution and suggestions re conjoint examinations as passed at the Conference of Medical Services of Canada."

Alberta:

July 25th, 1928—"The Council 'were not very sure as to the practicability of the scheme, that is whether the whole Dominion would enter into it.'"

British Columbia:

Aug. 21st, 1928—"That the Council of the College of Physicians and Surgeons of B.C. are in thorough sympathy with the general principles of a conjoint examination."

SUMMARY

In favour of the principle of conjoint examinations—New Brunswick, Manitoba, British Columbia. (3)

In doubt as to its feasibility for practical reasons—Ontario, Alberta. (2)

In doubt as to its advisability—Saskatchewan. (1)

No opinion received—Nova Scotia, Quebec. (2)

OPINIONS OF CANADIAN UNIVERSITIES

Laval University:

July 21st, 1928—"Very favourable to the study of the proposition."

Queen's University:

July 20th, 1928—"Favourable to the principle and ready to enter into a conference to devise some practical scheme to carry it out."

University of Toronto:

Dec. 6th, 1927—"It is desirable for a medical student to obtain his license to practise on the basis of one examination at the end of his course in medicine."

University of Western Ontario:

May 31st, 1927—"It was agreed that this (Conjoint Examination) is an ideal arrangement and something that we should look forward to, but at present it is not feasible."

University of Manitoba:

July 27th, 1928—"That we favour the idea of conjoint examinations provided such examination is maintained at the present high standard of

the examination of the Medical Council of Canada."

University of Alberta:

July 31st, 1928—"We think that an arrangement whereby a successful candidate of the final examinations in the University would not only obtain his Provincial but also his Dominion registration would be an excellent arrangement, and we would like to see it in force."

Dalhousie University:

No opinion received.

McGill University:

No opinion received, but the Secretary acted on Deputation to Medical Council of Canada, indicating a favourable attitude.

University of Montreal:

No opinion received, but Dean of Medical Faculty acted on Deputation to Medical Council of Canada, indicating a favourable attitude.

SUMMARY

In favour of the principle, or its study—Laval, Queen's, Toronto, Western, Manitoba, Alberta, McGill, Montreal. (8)

No reply received—Dalhousie. (1)

At the meeting of the Canadian Medical Association in Charlottetown in June 1928, the appointment of a deputation to interview the Medical Council of Canada was authorized. In September 1928, a deputation from the Canadian Medical Association was received by the Medical Council of Canada. This deputation presented the advantages of the introduction of Conjoint Examinations to the Council and urged the Council to approve of the principle involved.

The method of its disposal by the Council as recorded in the minutes was as follows:—

"It was moved by Dr. Simard, seconded by Dr. Stewart: THAT a committee be appointed to study the proposition made by the Canadian Medical Association in connection with one diploma and report to this Council."

"It was moved in amendment by Dr. Connell, seconded by Dr. MacCallum: THAT having heard the deputation from the Canadian Medical Association on the question of one examination for degree and license, the Council is of the opinion that the time is not opportune to commit the Council to the principle involved.

The amendment carried."

The Committee on Education is of the opinion that:—

1. The Graduates in Medicine from the Canadian Universities have received an education which adequately fits them to enter the practice of Medicine at the end of their course.

2. The student who has completed his medical education in a Canadian University should be able to obtain his University degree and his License to practice by passing an examination in the final subjects, conducted by a Board of Examiners composed of representatives from (a) the Universities and (b) the Medical Council of Canada and the Provincial Medical Councils.

3. The introduction of such a Conjoint Examining Board for final examinations would result in the maintenance of a high standard for qualification for both the degree and license and at the same time save the student both time and money.

The Committee, therefore, recommends that the Canadian Medical Association should respectfully request that Special Committees be appointed by the Medical Council of Canada and by the Provincial Medical Councils for the purpose of devising some method by which conjoint examinations can be conducted for both University degree and License to practice.

Committee: Duncan Graham, V. E. Henderson, J. A. Oille, W. L. Robinson, F. W. Routley, C. A. Warren, G. S. Young, E. S. Ryerson (Chairman).

All of which is respectfully submitted.

E. S. RYERSON,

Chairman.

Approved.

Considerable discussion ensued with reference to the question of establishing conjoint examinations. The following points were emphasized:—

To establish conjoint examinations would involve a change of legislation in so far as the Medical Council of Canada is concerned.

There should be unanimity of the various Provincial Councils and also the teaching bodies before such a change is considered.

Why not have all the examinations in the one week, and let the examiners for the Medical Council of Canada do the examining? This would, eventually, lead to one examination.

Rather than approach the Medical Council of Canada first, we should commence by urging the alumni organizations that they endeavour to reach a common conclusion and approach the universities; and that the universities, in turn, approach the various Provincial Councils, urging that one examination be held for graduation and licensure.

REPORT OF THE POST-GRADUATE COMMITTEE

Mr. Chairman and Members of Council:—

It is a pleasure for your Post Graduate Committee to submit herewith its third annual statement of the extra-mural post graduate work which we have been able to conduct throughout Canada,—thanks to the generosity of the Sun Life Assurance Company. It is indeed most gratifying to add that the work is continuing for the fourth year, due to the receipt of the fourth annual grant of \$30,000 from our benefactors.

In studying the two tables submitted hereunder, members of Council will observe that there has been a marked increase in the number of speakers and addresses utilized, also in attendance, while the cost per lecture per doctor has steadily decreased. In the opinion of your Committee, these figures bespeak very excellent progress in the conduct of the service.

SUMMARY BY PROVINCES OF POST GRADUATE WORK CONDUCTED BY THE CANADIAN MEDICAL ASSOCIATION

OCTOBER 1ST, 1927 TO SEPTEMBER 30TH, 1928				
Provinces	Number of Speakers	Number of Addresses	Attendance	Total Cost
British Columbia..	12	118	7,289	\$ 6,217.52
Alberta	15	152	4,465	4,829.03
Saskatchewan ..	13	82	2,009	3,573.45
Manitoba	35	50	3,026	2,144.78
Ontario	173	210	5,491	5,069.33
Quebec	49	91	1,010	5,523.52
New Brunswick...	10	34	478	1,807.53
Nova Scotia	9	31	680	1,844.02
Prince Edward Island	11	23	502	1,530.77
Newfoundland....	2	11	473	\$20.80
	329	802	25,423	\$33,360.75

COMPARATIVE STATEMENT COVERING THREE YEARS OF POST GRADUATE WORK

	1926	1927	1928	Totals
Number of Speakers..	169	269	329	767
Number of Addresses..	513	729	802	2,044
Average Attendance per lecture.....	29	27	31.7	29.2
Total Attendance.....	17,264	19,683	25,423	62,370
Total Cost.....	\$30,100.27	\$28,831.66	\$33,360.75	\$92,292.68
Cost per lecture per Doctor.....	\$1.74	\$1.46	\$1.31	\$1.50

Council will no doubt desire to express to the Sun Life Assurance Company its great indebtedness, not only for having financed the inauguration of this nation-wide post graduate plan, but for having made it possible for us to continue it for a period of four years.

All of which is respectfully submitted.
GEO. S. YOUNG. Chairman.

Approved.

In considering this report, several members of Council stressed the importance of urging local men to give papers at Medical Society meetings, in order that new talent may be developed, rather than to have the whole program provided by visiting speakers.

REPORT OF THE LISTER MEMORIAL COMMITTEE

Mr. Chairman and Members of Council:—

There is very little to report in connection with the Lister Memorial Committee this year.

Some months ago, a letter was sent to each member of the Committee, urging that every effort be made to have "Lister Day," celebrated in a fitting manner by the various Medical Schools and Medical Societies. In the Province of Nova Scotia, the Superintendent of Education arranged for a broadcast to the schools of the Province, in which your Chairman had the privilege of taking part.

Your Committee would recommend to the various Universities that April 5th be noted in their Calendars as "Lister Day."

Next year, at the joint meeting with the British Medical Association in Winnipeg, the third Listerian Oration will be delivered by Sir Berkeley Moynihan.

All of which is respectfully submitted.
JOHN STEWART, Chairman.

Approved.

In connection with this report, it was suggested that all the universities be urged to note the date, April 5th, as Lister Day, and have it listed as such in the University Calendars.

REPORT OF THE OSLER MEMORIAL COMMITTEE

Mr. Chairman and Members of Council:—

In view of the fact that this is the third Annual Report sent forward by this Committee and that, at the present meeting, there will be given the first Osler Oration, it seems advisable to review progress and offer suggestions regarding the continuation of the work of this Committee.

While our Committee was officially appointed at the meeting in Victoria in 1926, it should be understood that

this action was the logical development of a suggestion made at a meeting of the Executive, several years previously, when the question of establishing a Lister Oration was up for consideration. It was agreed at that time, that following the completion of the collection for the Lister Fund, this Association should immediately consider the advisability of commemorating the life and work of Osler in a somewhat similar manner.

After the Committee had been officially appointed, the local group which had been named as the nucleus of the Committee carried on a correspondence throughout the Dominion with many who had been privileged to enjoy personal and intimate contacts with Osler during his life, and also with other leading members of our profession, who had been inspired by his great record of achievements. There was no difficulty in persuading many to co-operate and it soon became evident that it would be necessary to enlarge our numbers beyond the precedent for other Committees.

From this correspondence, there was a wide-spread expression of opinion indicating that the profession in Canada would not permanently be satisfied with the mere establishment of the Osler Oration. In an appeal to Council, based on replies received, permission was sought and granted for the future enlargement of scope in the interests of a more suitable memorial, which in addition to the Oration, might include Scholarships, Fellowships, Bursaries and Osler Clubs.

The work of the Committee, up to the present time, has been largely a matter of developing organization to these ends and we must frankly admit that our machinery is not yet ready for co-ordinated action and production of the results, which we must surely ultimately attain. It would be a great disgrace to Canada, if a larger number than those who have already subscribed were not given the privilege of an opportunity of subscribing to this undertaking and we have indicated a plan which should ultimately reach every individual member of all local Societies.

In the process of developing our organization originally, we followed the method established for all Committees, namely a Local Nucleus with corresponding members from each of the Provincial Branches. It may be that in view of later developments this is not the most suitable method for attaining our objectives. It has already occurred to us, that this Committee should have a more direct contact with all the various Provincial Branches of the Association. It has been suggested that these should be made responsible for the organization of our Provincial Units and we would request permission of Council to approach the Provincial Associations for this purpose.

Our Committee looks forward to the ultimate success of the plan already initiated or some further modification of the same and expects the co-operation of those who have been interested. Our proposal is that we must exert sufficient influence so as to give every member of the profession in Canada a real opportunity to subscribe. Through the local societies, we must make the members understand their duty and privilege in this great undertaking. It seems desirable to continue our efforts in this direction until we have a report from all local Societies that each has reported the maximum returns from their Society.

It should be understood that the amount necessary for the endowment of the Oration is \$5,000.00. A further amount is necessary to provide funds for secretarial purposes, in order to make it possible to develop the widening of the scope which as suggested should come through the appointment of Sections for the later consideration of each of the various proposals.

The Committee appreciate the fact that they cannot undertake to raise funds for any proposal other than the Osler Oration until the work of the Sections has been developed up to the stage where they may, acting through this Committee, present their recommendations to Council and that any recommendations from this Committee to Council must receive the sanction of Council before their proposals may be undertaken or followed up.

It has been said that the rising or next generation will appreciate Osler more than that just passing on. Several of our members still living knew Osler personally

and to them he was the intimate and trusted friend. Others were his house officers or students and with these he exhibited paternal relations, the guide and counsellor, always interested and stimulating their investigations and productions. Others belonged to the families of the previous groups and to them he was just another adopted uncle who came on his visits, at longer or shorter intervals, with a story to tell, played jokes on the boys and teased the girls regarding their future prospects.

Generations which follow, better than any of these, will know Osler as a great world figure in medicine. They will understand, in proper perspective, the magnitude of his work and the variety of his activities. Even today we know that many of our younger men who never knew Osler have received the spark of inspiration from what they have been told and read in the literature already available.

It is not without hope that we will discover, partly as a result of our activities, that others in larger or smaller groups in many communities will become more interested in the life and work of Osler and the various phases of medical practice in which he was engaged. Through their interest and enthusiasm and attempts to emulate his example, great benefit will accrue to the medical profession throughout Canada.

By these means, we will be able to guarantee a greater and everlasting memorial as to its objective and a credit to the profession in Canada.

The paid up subscriptions, including Bank interest to date, make a total of \$3,778.05, of which \$3,425.00 has been deposited with the Treasurer. An audited statement of our expenses is being presented to the Hon. Treasurer, which indicates that we have been able to keep the same within ten per cent of the monies collected as directed by the Executive.

We would request that, after the Endowment Fund for the Oration has been provided for, this Committee, during the coming year, may be permitted to use, in like manner, from surplus funds collected, sufficient to take care of secretarial expenses. By this method ample provision will be made for keeping the work of the Committee alive and active in the interests of the ultimate objective.

All of which is respectfully submitted.

J. HEURNER MULLIN,
Chairman.

Approved.

In the discussion on this report, it was recommended that the establishment of Osler Clubs, both undergraduate and post-graduate, be encouraged by the medical profession.

REPORT OF THE COMMITTEE ON THE MEDICAL SERVICES IN CANADA

Mr. Chairman and Members of Council:—

The first Conference of the Medical Services in Canada was held in the House of Commons, Ottawa, in December 1924. The second was held in the same place in March 1927. Both of these Conferences were very successful from every point of view.

At the meeting of the Executive Committee held in Montreal on October 20th, 1928, the following Resolution was passed:—

"That the third Conference be not held before the Autumn of 1929. The time to be subject to later consideration by the Executive Committee."

In view of the undoubted value of these conferences, your Committee asks to have the question of the time of the next conference placed before the members of the incoming Executive Committee for consideration.

H. H. MURPHY,
Chairman.

It was pointed out that, as the Charter Fellows of the Royal College of Physicians and Surgeons of Canada must meet in Ottawa within six months of the passing of the Bill, it might be possible to arrange for the Conference on the Medical Services in Canada at the same time. It was finally decided that this matter should be left to the Executive Committee.

At the meeting of the Executive Committee on June 19th, it was agreed that the two meetings above referred to should be held in November, the exact date to be set by the General Secretary.

Note: The Royal College of Physicians and Surgeons of Canada will hold its inaugural meeting in Ottawa on Tuesday, November 19th next. Arrangements for holding the Conference on the Medical Services in Canada concurrently are now under consideration.

REPORT OF THE COMMITTEE ON MEDICAL SURVEY

Mr. Chairman and Members of Council:—

Your Committee begs leave to report as follows:—

The problem of the inadequate medical services in some of the rural communities in Canada has been studied by your Committee. The cause is largely economic, and the cure lies in the increased prosperity of Canada, not only in the rural, but also in the urban centres. The automobile, paved roads, telephone, radio, and the aeroplane have contributed in mitigating the hardships caused by the passing of the good old-fashioned family doctor, who gave efficient services in the villages and smaller towns. These modern improvements have increased the range of territory that can be served by the same number, or even a less number of physicians.

Various remedies, not cures, have been tried, all with more or less success. Municipalities in Saskatchewan, for example, pay salaries up to \$4,500 a year to physicians, as an inducement to locate in communities that cannot adequately support a physician, and are in need of medical care. Alberta is experimenting with embryonic state medicine, such as travelling clinics, etc. The Red Cross Outpost Hospitals, the Victorian Order of Nurses, and other lay organizations have been most helpful in providing medical and nursing service.

The migration of recent graduates to foreign countries has caused considerable concern during the past decade, but the tide has turned, and this problem has been practically solved. Here again the cause was economic.

Your Committee wishes to recommend that the central office secure biographical data of every physician and medical student in Canada, so that the following information would be available:—

1. Total number of physicians in practice in Canada:
 - (a) in the cities
 - (b) in towns of five thousand people
 - (c) in towns of less population.
- (2) Average age of the physicians.
- (3) Total number of physicians over sixty years of age, men who will not likely be in practice for ten years more.
- (4) Total number of medical students graduating each year.

(5) Number of graduates who annually qualify to practise, in order to determine whether the profession is overcrowded, and to pass this information on to prospective students.

(6) Number of men who are practising a specialty.

All of which is respectfully submitted.

J. W. CRANE,

Chairman.

Approved.

REPORT OF THE COMMITTEE Re ROYAL COLLEGE OF SURGEONS OF ENGLAND

Mr. Chairman and Members of Council:—

The project which was undertaken by this Committee in June 1925, has been brought to a successful issue. Arrangements are now completed for holding the primary examination for the Fellowship of the Royal College of Surgeons, in Canada, at an early date.

Four examiners will proceed from England to conduct the examination in Toronto. The examination by written papers will be conducted on August 6th and 7th. The oral examinations will be held on August 9th and 10th. The following examiners have been appointed by the Royal College of Surgeons.

In Anatomy:—

Professor Wm. Wright, D.Sc., F.R.C.S. (London Hospital); Professor Le Gros Clark, F.R.C.S. (St. Thomas' Hospital).

In Physiology:—

Professor C. Lovatt-Evans, F.R.S. (University College); Professor John Mellanby, M.D. (St. Thomas' Hospital).

As assessors we have nominated the following:

In Anatomy:—

Professor J. P. McMurrich, University of Toronto.

In Physiology:—

Professor C. H. Best, University of Toronto.

The appointment of these assessors has not yet been confirmed by the Royal College of Surgeons.

Your Committee has been very active, mainly through the Chairman, the Secretary of the Association and Dr. Bazin, in keeping the various Universities in Canada informed as to the arrangements being made and the facilities offered for the conduct of this examination in this country. There has been a large amount of correspondence with the College, with the Universities in Canada and with the individuals who were prospective candidates. The columns of the *Canadian Medical Association Journal* have been put at our disposal and have been used freely for advertising purposes.

As time went on it became obvious that a number of students and graduates from different parts of Canada were interested. At the beginning of the current session various Universities began special courses of instruction for those who desired to present themselves for examination.

It was required that applications for the examination should be made by candidates to the General Secretary of the Canadian Medical Association not later than April 13th, 1929. On that date thirty applications were received: these were distributed as follows:—

University of McGill.....	8 candidates
University of Toronto.....	8 "
Queen's University.....	3 "
University of Western Ontario.....	3 "
University of Manitoba.....	2 "
University of Alberta.....	1 "
University of Saskatchewan.....	2 "
University of Minnesota.....	2 "
(Mayo Foundation)	
Columbia University, New York....	1 "
Total.....	30 "

It is most gratifying to find that our initial venture has been so successful. It has been proved that there is a demand in Canada for the opportunities offered by the College in conducting these examinations in this country. The Canadian Medical Association is to be congratulated on the success attained.

We wish to record our great obligation to the Royal College of Surgeons of England for the splendid manner in which they have met our wishes by completing arrangements to conduct the primary examinations for the Fellowship in Canada. From the first approach made to the College by the officials of the Canadian Medical Association, our reception has been most courteous and sympathetic. The difficulties encountered have been great but they have all been overcome. We are under deep obligation to the ex-president of the College, Sir John Bland-Sutton, the present president, Lord Moyrihan, the Council of the College, and the Secretary, Mr. Cowell, for their sympathetic co-operation. In recording our gratitude we wish to extend our thanks to Mr. H. W. Carson, F.R.C.S., who took a valuable part in the first discussion of this project at the meeting of the Canadian Medical Association at Regina in 1925.

All of which is respectfully submitted.

A. PRIMROSE,

Chairman.

Approved.

REPORT OF THE COMMITTEE ON CONSTITUTION AND BY-LAWS

Mr. Chairman and Members of Council:—

In accord with instructions given at the last annual meeting, your Committee on Constitution and By-Laws have considered the value to the Association of having on the Council a man representing the medical activities of the Federal Government.

The unanimous feeling of your Committee is in favour of having a Federal representative on the Council and that the man selected by the Minister of Pensions and National Health should be a *representative* rather than a delegate, since not only will he have voting power on the Council, but in addition will be expected to represent the views of the Department of Health of that time.

We think that we should not concede to the Minister the right of *appointment* to Council, feeling that the power of election to the Council should be retained by that body or by the Executive.

Such representative of the Minister may be elected an Honorary Member by the Council or Executive under Article IV of the Constitution. As an Honorary Member he would enjoy all the rights and privileges of the Association as provided in Chapter I, section 4 of the By-Laws and would not be required to pay the annual fee. It is understood that Honorary Membership for a particular representative shall lapse on the termination of such representative's period of selection.

Article IX of the Constitution would therefore be amended by the addition of the following clause:—

(g) A representative of the Department of the Federal Ministry of Pensions and National Health (or such department as may control national health) to be designated annually by the Minister, whose election to the Council shall be subject to the approval of the Council or Executive.

All of which is respectfully submitted.

T. G. HAMILTON.

Chairman.

Approved.

REPORT OF THE STUDY COMMITTEE ON NURSING OF THE CANADIAN MEDICAL ASSOCIATION AND THE CANADIAN NURSES' ASSOCIATION

Mr. Chairman and Members of Council:—

The Joint Committee, representing the Canadian Nurses' Association and the Canadian Medical Association has had several meetings since the last report was presented to Council at Charlottetown. The members of the Committee were unanimous in their belief that a national survey should be made but were unable to find means whereby it could be financed. Overtures were made to the Carnegie Corporation but after a good deal of correspondence, we learned that they would only consider granting funds to our Committee provided our work could be made a part of the work being done by a similar committee in the United States. We naturally declined to accept a position of that kind.

At a meeting of the Executive of the Canadian Nurses' Association held during the winter, they agreed to provide \$5,000 towards the study, and suggested, that, if possible, a competent, independent person be secured to prosecute the work,

At the last meeting of the Joint Committee held in Toronto on April 11th, it was decided to ask Dr. Geo. Weir, Chief of the Department of Education, in the University of British Columbia, to undertake this survey. I may say that the doctor has been approached with respect to the study and has expressed his willingness to undertake the work on certain conditions. Negotiations are in progress with Dr. Weir as this report is being prepared but we have nothing definite to announce. In all probability, further information will be forthcoming by the time of the annual meeting in June.

In view of the fact that the committee is unanimous in believing this study should be made at this time and done by a competent, independent person trained in such work, and further because the Canadian Nurses' Association have shown their deep interest by subscribing \$5,000 and a willingness to offer more if necessary, we recommend to this Council that the sum of \$2,500 be set aside for this survey, such sum to be paid as required over a space of eighteen months.

All of which is respectfully submitted.

G. STEWART CAMERON,

Chairman.

Approved.

Supplementing this report, Dr. Cameron stated that Professor George Weir of the Department of Education, University of British Columbia, had been secured to direct the survey, commencing in the Province of Ontario next autumn.

REPORT OF THE DEPARTMENT OF HOSPITAL SERVICE

Mr. Chairman and Members of Council:—

The Department of Hospital Service has now been in operation some sixteen months, a period which has given us sufficient time in which to become cognizant of the various hospital problems in Canada and to appreciate the extent of the need for some such service. During this period, as many hospitals as time would permit have been visited in all parts of Canada. This has enabled us to obtain first-hand information on many problems and, by passing on ideas and suggestions gleaned elsewhere, we have been enabled to be of some assistance.

A number of hospital surveys have been conducted and weak points in the relationship of the hospital to the

public have been indicated. Difficulties arising in the course of staff organization have been studied at the request of hospital staffs or the local medical societies. In many communities, the hospital or the local medical personnel has outgrown the type of staff organization and more efficient and more equitable systems have been suggested. In response to various requests, a code of Staff Bylaws and Regulations, especially designed for the smaller hospitals, has been prepared.

Recently a new column, "Hospital Service Department Notes," has been created in our *Journal*. Our object in these pages will be to prepare or select articles on hospital subjects of especial interest to the medical reader. We have noted that many topics are discussed in the various hospital journals which are of vital concern to the doctor but are seldom called to his attention. Comments on, or excerpts from, such articles will appear in this column.

Considerable time has been consumed in the preparation of the data for the new Directory of Hospitals in Canada. This has entailed considerably more labour than was anticipated, for we found that available lists were very incomplete and far from up-to-date. The maps have been prepared for us by the Natural Resources Intelligence Service at Ottawa and, through the courtesy of the Department of Pension and National Health, the Directory is now being printed for distribution by the Government Printing Bureau.

During the past year our Department has been in contact personally and by correspondence, with representatives of the hospitals in the Maritime provinces with a view to forming one or more hospital associations and thereby facilitate closer co-operation in the study of their mutual problems. In February, a New Brunswick Hospital Association was formed and in March the hospitals of Nova Scotia organized. Opinion, on the question of amalgamation, has not, as yet, been crystallized and for the present, at least, the two associations will concentrate on their own provincial considerations.

Among other activities, our Department has placed a fair number of our recent graduates as internes in our Canadian hospitals. Papers on hospital topics have been published in various journals and addresses have been given to hospital conventions, to nurses' meetings, to service clubs, at nurses' graduation exercises and at public meetings in connection with hospital campaigns and "Hospital Day" celebrations. Tariff regulations, appertaining to hospital equipment, are being studied. Also, our Department has dealt with over five hundred requests from all over Canada—requests for information or advice on various problems in construction, equipment, administration, organization, instruction, public relations, etc. To meet these requests a reference library on various hospital topics has been established.

Several hospital administrators and staff doctors have brought to our attention the need for a Hospital Pharmacopœia which would be especially prepared for use in small hospitals. It has been pointed out that a practical guide in dispensing would tend to reduce the great wastage and loss to the hospitals attendant upon the prevalent habit of prescribing proprietary preparations and that, by including in this book the newer and accepted clinical laboratory and other procedures, such a work would prove very useful to all hospital workers. Various existing Hospital Pharmacopœia have been consulted and, in co-operation with the Committee on Pharmacy, we are now making a study of the scope to which this book should be extended.

The members of our Advisory Committees, Doctors A. K. Haywood (*Chairman*), F. C. Bell, L. A. Lessard, S. E. Moore, F. W. Routley, the late H. R. Smith and Geo. F. Stephens, have given unstintingly of their advice and counsel in formulating the policy of this Department. We regret exceedingly the untimely death of the late Dr. H. R. Smith of Edmonton. By his sudden departure, the hospital world lost one of its soundest and most beloved leaders. His place on this Committee has been taken by Dr. M. R. Bow of Edmonton. It is our wish that this Advisory Committee be reappointed as under the prevailing arrangement for the forthcoming year.

COST OF HOSPITAL CARE

This subject is now being discussed at great length in the magazines, newspapers and elsewhere. The public, apparently, is becoming convinced that our present system of hospital care is extravagant and that the costs to the private patient are higher than necessary. The most deplorable feature of all this unrest is that the vast majority of comments appearing in the press are based upon utter ignorance of hospital problems. That improvement is possible is readily admitted by all administrators, but the really essential points are seldom stressed by these writers. There is a great need for public enlightenment, for authoritative articles in the lay press and for a serious study of the situation to forestall hasty and ill-advised legislation. Of interest to the doctor is the fact that many solutions proposed, based upon European methods, do not seem to consider the remuneration of the physician or surgeon at all.

It might be a legitimate use of some of our funds to appoint a commission of representative hospital workers, lay, nursing and medical, to study this whole question of hospital cost. Various relevant factors, such as government and municipal care of indigents, standardization of equipment, group nursing, co-operative purchasing, tariff on hospital equipment, and compulsory motor liability insurance, might be considered and incorporated in the report of this commission.

Looking back over the year's work, one gets the impression that one of the most important, though somewhat indirect, results of the inauguration of this Department has been the opportunity it has offered to present the Canadian Medical Association in a favourable light to the leaders in public life. A large share of our work is with hospital boards, which are composed, to a great extent, of the leaders in the civic, financial and philanthropic life of the community, and they have repeatedly expressed their appreciation of the altruistic and public-spirited motives of the Canadian Medical Association, an organization which many of them had thought to be essentially a class-conscious monopoly-seeking society. One of the obligations of this Department will be to draw closer together the professional and the administrative viewpoints in hospital work and to demonstrate to the public that organized medicine is constructive, not obstructive.

Again we wish to record our appreciation of the generosity of the Sun Life Assurance Company which has made this work possible.

All of which is respectfully submitted.

G. HARVEY AGNEW,
Secretary.

Approved.

In speaking to his report, Dr. Agnew stated that suggestions as to how this Department might be enabled to render better service would always be welcome.

Several members of Council spoke very highly of the excellent work already done by Dr. Agnew in his capacity as Secretary of this Department of the Canadian Medical Association.

REPORT OF COMMITTEE Re ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

Mr. Chairman and Members of Council:—

The nucleus of the Charter Fellows for the proposed Royal College of Physicians and Surgeons of Canada desires to report that, during the past year, a great deal of work has been done, more especially by correspondence, in preparing and bringing before the House of Commons at Ottawa a Bill, leading to the formation of

the College. We are glad to report that the Bill has now passed its third reading in the House of Commons, and, at time of going to press, awaits the approval of the Senate and the Governor-in-Council.

It is proposed to convene those who are eligible for Charter fellowship at the earliest convenient date; but no steps have been taken in this regard, pending the definite establishment of the College by the authorities at Ottawa.

Herewith is a copy of the Bill:—

BILL NO. 84

AN ACT TO INCORPORATE The Royal College of Physicians and Surgeons of Canada.

[Assented to 14th June, 1929.]

Preamble, 1909, c. 62.

WHEREAS The Canadian Medical Association, a corporation constituted by chapter sixty-two of the statutes of 1909, has by its petition prayed in effect that it may be enacted as hereinafter set forth; and whereas His Majesty King George V, has been graciously pleased to grant permission to the College to use the title 'Royal'; and whereas it is expedient to grant the prayer of the said petition: Therefore His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

Interpretation

1. In this Act unless the context otherwise requires:

The College

(a) "The College" means the corporation constituted under the provisions of this Act;

The Council

(b) "The Council" means the Council of the said College;

Fellows

(c) "Fellows" means members of the College;

Charter Fellows

(d) "Charter Fellows" means members of the College who become such upon the coming into force of this Act, together with those persons selected and admitted as Fellows within two years thereafter.

Incorporation—Corporate name

2. Those persons holding at the date of the coming into force of this Act, appointments as professors in medicine, surgery, gynecology or obstetrics in a Canadian university together with the persons from time to time selected and admitted as, or otherwise being, Fellows of the College pursuant to this Act, upon their consent so to act, are hereby constituted a corporation under the name of "The Royal College of Physicians and Surgeons of Canada", and when the French language is used to designate that corporation the equivalent name shall be "Le Collège Royal des Médecins et Chirurgiens du Canada."

Provisional Council.—Election of Council

3. The General Secretary of The Canadian Medical Association shall call together, at Ottawa, within six months of the passing of this Act all those entitled to become Fellows of the College, as set out in section two of this Act. All those present at such meeting shall constitute a provisional Council. It shall be their duty at this meeting to elect a Council with such officers and officials as they may deem necessary. The elected Council officers and officials shall hold office in accordance with the provisions of this Act and with the by-laws, rules and regulations of the College.

Tenure of office

4. The Council shall hold office for a period of four years, and until their successors are elected and hold their first meeting.

Fellows

5. The Council may, at any time within two years after the coming into force of this Act and without examination, select and admit as Fellows any duly qualified persons domiciled in Canada who have in their opinion given evidence of high ability in one or more departments of medicine.

Admittance of physicians and surgeons as Fellows

6. The Council may without examination, select and admit as Fellows, physicians and surgeons practising in Canada and licensed to practise in at least one of the provinces thereof, and holding a diploma or fellowship issued or granted after examination by a recognized medical or surgical organization constituted by the laws of the United Kingdom of Great Britain and Northern Ireland, the Irish Free State, any of the British Dominions, the Republic of France, or of such other countries as the Council may direct, if in the opinion of the Council such diploma or fellowship is of equal status to fellowship in the College.

Honorary Fellows

7. The Council may without examination select and admit as Honorary Fellows such distinguished physicians, surgeons or other persons resident within or without Canada as the Council may deem fit.

Admittance to fellowship

8. (a) Except as hereinbefore mentioned no person shall become or be admitted as a Fellow of the College until he shall have complied with such by-laws and regulations as the Council shall from time to time consider expedient, and unless he shall have passed such special examinations, in either the English or the French language, by the examiners of the College as the Council shall from time to time prescribe and direct for candidates for fellowship, but every fit and proper person, qualified as hereinafter set forth and having complied with such rules and regulations and passed such special examination, as hereinbefore set out, shall be entitled to be admitted as a Fellow of the College.

(b) All candidates wishing to be examined in either the English or the French language, for fellowship in the College shall be graduates of not less than three years standing of a Medical School or University approved by the Council, and shall hold license to practise medicine in at least one of the Provinces of Canada.

(c) The Council may by by-laws provide for the organization of the College into medical and surgical divisions and for admission into fellowship in the College in one or other of such divisions in which event a Fellow of the Surgical Division may be known and designated as a Fellow of the Royal College of Surgeons of Canada, or in the French language as 'Associé du Collège Royal des Chirurgiens du Canada', and a Fellow of the Medical Division may be known and designated as a Fellow of the Royal College of Physicians of Canada, or in the French language as 'Associé du Collège Royal des Médecins du Canada'.

Diplomas

9. (a) The admittance of every Fellow or Honorary Fellow of the said College shall be by diploma under the seal of the said College in such form as the Council shall from time to time think fit, provided that one or more general diplomas may be granted or issued covering the admittance to the College of such Charter Fellows.

Register

(b) The Council shall cause the name of every Fellow or Honorary Fellow for the time being of the College to be entered, according to the priority of admittance or otherwise as the Council may direct, in a book or register to be kept for that purpose at the headquarters of the College or such other place as the

RE DOCTORS' ACCOUNTS

It having been brought to the attention of the Association that, in the settlement of estates, doctors' accounts were not considered as preferred accounts, the Committee on Legislation was instructed to investigate the matter and report to the Executive Committee at a later date.

MOTOR EMBLEMS

The new design for a motor emblem, combining the caduceus and green cross, was approved

by the Executive Committee, and a number will be available for distribution at an early date.

CONCLUSION

Attention was given to a great many other details in connection with the work of the Association, which were passed to the various committees for consideration and report.

All of which, on behalf of the Council and Executive Committee of the Canadian Medical Association, is respectfully submitted.

T. C. ROUTLEY,
General Secretary.

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The Presidential Address

ON

THE DEBT OF MODERN SURGERY TO THE ANCILLARY SCIENCES*

BY ARTHUR HENRY BURGESS, D.L., M.B., CH.B., M.Sc., F.R.C.S.,

Professor of Clinical Surgery, University of Manchester;

Honorary Surgeon to the Manchester Royal Infirmary,

Manchester

[The President began his address with a brief consideration of the remarkable change that had come over surgery as a result of the adoption of Listerism, and showed how "antiseptic" had finally given place to "aseptic" surgery. He, also, gave some personal reminiscences of his connection with surgery at the Manchester Royal Infirmary which dated from 1893.]

AS a sequel to the increased safety engendered by the practice of Listerism there naturally followed the extension of surgery into anatomical fields hitherto approached only when urgent necessity demanded the repair of grave injury. Concerned at first mainly with the limbs and the more readily accessible parts of the trunk, attacks were soon made upon the great cavities of the body—the cranial and spinal cavities, the abdomen, and the chest. Thus the operative field has been gradually extended until now every part of the body has been brought within the sphere of surgical activity. Even the heart—always prominent in popular imagination—is no exception; its stab wounds have been many times successfully sutured, bullets have been extracted from its walls and even from its cavities, and plastic operations have been performed actually upon its valves, while injection of drugs directly into the heart muscle, and massage of the heart through either an abdominal or a

thoracic incision have become part of the routine treatment of cardiac failure during anæsthesia. At the present time prominent surgical attention is being paid to the last remaining surgically unfamiliar system—the sympathetic nervous system—and to the last remaining organ—the suprarenal body.†

Of the advances that have occurred in almost every branch of surgical work during the present century (a period almost coincident with that since the last visit of the British Medical Association to this city) I think it will be generally admitted that the most outstanding is that in the department of abdominal, and especially of acute abdominal, surgery.

Similar progress, though perhaps less dramatic, has been maintained in the surgery of non-urgent abdominal conditions. [The President here quoted statistics from the Surgical Service of the Manchester Royal Infirmary in support of his statements.—Ed.]

Time does not permit me to make more than a passing reference to the present-century advances in other departments of surgical work, though specific mention must be made of the wonderful progress in orthopædic surgery under the stimulating influence of Sir Robert Jones,

* Delivered at the Ninety-Seventh Annual Meeting of the British Medical Association, at Manchester, July 23, 1929, and published here (somewhat abridged) by courtesy of the *British Medical Journal*.

† Opel of Leningrad, in *Annals of Surgery*, June, 1928, reports 130 adrenalectomies for Raynaud's disease, and other forms of "hyperadrenalinæmia."

of the extraordinary achievements during and since the war in plastic and reconstructive surgery, more especially of the face and jaws, prominently associated in this country with the name of Major Gillies, and of the great increase in our knowledge of the surgical treatment of tuberculosis of the lungs and of other intra-thoracic diseases.

This progress in surgery—which, I feel strongly, will compare favourably with that attained in any other branch of the arts and sciences—has not, nor could it have, been achieved without the material assistance of the contemporary advances in the allied sciences; it is, indeed, this which constitutes my main thesis to-night. Modern victories are rarely won single-handed, and the greater the number, the more effective the strength and the more vigorous the activities of the allied forces whence assistance is forthcoming, the more confidently may we look forward to a victorious issue. Prior to the time of John Hunter surgery was almost entirely an art—a glorified handicraft, taught and practised quite independently of all other arts and sciences, devoid of any physiological basis for its methods, and essentially empirical in its attempts at progress. Hunter, deeply imbued with the scientific spirit, introduced into surgery the method of careful observation, collection, and collation of facts, and their thorough testing by direct experimental investigation, rather than that of trusting to theories founded on insufficient and unproved evidence. “Don’t think—try” was his favourite exhortation. He it was who first gave allies to surgery, urging that surgery should be regarded as a branch of natural science, to be studied in its appropriate relationship to all the other branches, thus bringing it into close association with chemistry, physics, biology, comparative anatomy, physiology, and pathology. Had the microscope been available in Hunter’s day he would doubtless have added to these bacteriology. . . .

Though the choice for consideration to-night of a few only of the numerous component factors of this debt of modern surgery to the ancillary sciences must necessarily prove an arbitrary and rather an invidious task, yet I feel that the consensus of surgical opinion will endorse my selection of physics and of physiology as the two sciences to which, in recent times, surgery is most indebted; and further, that of the many

useful applications in surgery of the results of researches in physics three have established a special claim upon our attention—x-rays, radium, and light therapy.

RADIOLOGY

The x-rays, discovered by Wilhelm von Röntgen of Würzburg in 1895, were early applied to the diagnosis of pathological states in the human being, and thus was founded the science of radiology, whose subsequent brilliant achievements not only constitute one of the most important chapters of progress in medical affairs during the present century but also open up vistas of still greater possibilities for the future.

The organs and tissues of the body vary in the degree of resistance they offer to the passage of the x-rays, and it is upon the relative opacity of an organ to that of the tissues in its immediate vicinity that the possibility of demonstrating its shadow upon the radiographic plate or screen depends. . . .

Foreign bodies are displayable in proportion to their density, those of a metallic nature taking the first place. Had we not had available during the great war the assistance of the x-rays in the detection and accurate localization of the bullets, shell fragments, and other metallic particles lodged in the tissues of so many of our wounded, war surgery would have had a very much less successful tale to unfold. . . .

The assistance of the x-rays in the diagnosis and treatment of fractures and dislocations has proved invaluable, and the advice given recently by the council of the Medical Defence Union in a circular letter to its members, to insist upon radiography in every case of suspected fracture, would appear to be extremely sound from several points of view other than the intended one of defence against a possible legal action for malpraxis. Radiography soon taught us that in a large proportion of what were formerly considered to be merely “sprains” of joints some definite bony injury was present, the overlooking and consequent failure to apply appropriate treatment to which explains the popular idea that “a sprain is worse than a break.” Many incomplete and impacted fractures, and some of those without displacement, cannot be detected by any other means than radiography, and of this the general public is becoming aware. The public is, however, much too prone to estimate

the success or failure of treatment of a fractured bone by the extent of the anatomical deformity displayed in the radiogram, rather than by the functional result; to the popular mind the "setting" of a fractured bone seems to imply that the radiographic picture should show the perfect apposition of the broken surface—an ideal which, though frequently most eloquently stressed by counsel for the plaintiff in an action for malpraxis, is, as the medical profession knows only too well, rarely attainable apart from open surgical operation.

X-ray apparatus is now so efficient that the finest details of structure of the bones are easily shown, and the slightest changes therein induced by early disease can be readily detected. Thus the earliest manifestations of tubercle, of rickets, of syphilis, and of new growths as they affect bone are readily recognizable, and such knowledge conduces to earlier and more effective treatment. One of the commonest applications of radiography of the present day is that to the sockets of the teeth, and many a local source of origin of "focal sepsis," otherwise inexplicable, has been thereby disclosed.

At an early stage of radiography its utility was vastly extended by the introduction of substances opaque to the x-rays into parts of the body otherwise radiolucent, thus rendering them visible. The ramifications of sinuses in the soft parts were demonstrated radiographically by previously injecting them with bismuth paste. The introduction of the bismuth, and, later, of the barium meal has been the outstanding advance in radiology, and has completely changed many of our former ideas regarding the anatomical position, the form, and the physiological movements of the different parts of the alimentary tract, while it has added in a truly marvelous degree to our knowledge of their pathology. Radiology, to the infinitely greater safety of the patient, has entirely displaced the bougie in the diagnosis of oesophageal obstruction, and yields an accuracy of information as to the exact situation, extent, and nature of the cause of the obstruction previously quite unattainable. It thus differentiates readily between simple cicatricial stricture, malignant stricture, compression of the oesophagus by tumours from without, and the very imperfectly understood muscular obstruction at its lower end, to which the term "cardiospasm" is applied. The presence, situa-

tion, size, and shape of pharyngeal and oesophageal diverticula are demonstrated with certainty by means of the opaque meal, which has also taught us that diverticula of the alimentary canal, though most frequently met with in the pelvic colon, may occur also in the rest of the large intestine, in the appendix, the small intestine, the duodenum, and even in the stomach. The recognition of gastric and duodenal ulcers, of their complications, such as hour-glass contraction and pyloric stenosis; of gastric cancer, more particularly in its earlier stages; of obstructions of the intestines, especially that of carcinoma of the colon, by means of the opaque enema, either alone or in combination with the opaque meal; of displacements of the viscera such as are observed in diaphragmatic hernia or in visceroptosis; and the demonstration by Graham's method of the outline of the gall-bladder some ten to twelve hours after the administration of tetraiodo-phenolphthalein, owing to the power of this viscus to concentrate the bile, in which the drug is excreted, to such a degree as to prove opaque to the x-rays—all these constitute veritable triumphs of radiology, and have enormously facilitated the diagnosis of abdominal conditions.

Much the same may be said of the application of the opaque ureteral bougie and of the introduction of opaque media into some part of the genito-urinary tract during radiography—pyelography, ureterography, cystography, or urethrography, according to the portion of the tract concerned. Of these, pyelography has been most employed, and has disclosed alterations in the size, shape, and position of the renal pelvis, calyces, and ureters which have proved of the highest possible value in the diagnosis of renal pathological states.

The introduction into the trachea of the opaque medium lipiodol—a combination of 40 per cent iodine with oil of poppy seed—renders the bronchi and their ramifications visible upon a radiogram taken very shortly afterwards, and has been found useful in determining the relation of a foreign body in the lung to the nearest accessible bronchus, in demonstrating the outlines of lung abscesses, the presence and extent of bronchiectasis, the existence of a bronchopleural fistula, and the extent of malignant growths involving the bronchi. Lipiodol was originally recommended by Sicard of Paris in

1921 for the localization of the site of blockage of the subarachnoid space by spinal cord tumours. Introduced into the upper part of this space, as by injection into the cisterna magna, the medium falls by gravity to the level of the upper limit of the obstruction, and can there be radiographically shown. By injecting into the lumbar sac an "ascending" mixture of lipiodol and olive oil, of lighter specific gravity than the cerebro-spinal fluid, the lower extent of the subarachnoid block can be defined. The method is not altogether devoid of danger, and lipiodol, once introduced, appears to remain unabsorbed for a long period, even for years. The injection of lipiodol into the uterine cavity has been used to indicate its size and shape, and any encroachment upon it, as by a growth, while the failure of the medium to pass along one or both Fallopian tubes has been utilized in the diagnosis of their obstruction in cases of sterility.

Another method of altering the relative densities to x-rays of adjacent soft structures, and thus rendering their outlines visible, is the introduction of a gaseous medium—air, oxygen, or carbon dioxide—as into the perirenal tissues, thereby allowing the outline of the renal shadow to be readily discerned; or into the peritoneal cavity, when the liver, spleen, and kidneys are rendered visible. The withdrawal by puncture through a drill hole in the skull of a small amount of fluid from one of the lateral ventricles of the brain and its replacement by air or oxygen has allowed the outlines of the ventricles to be rendered visible upon the radiographic plate; their increased size in internal hydrocephalus can thus be readily demonstrated, whilst the position relative to the ventricle of an otherwise obscure cerebral tumour can often be accurately ascertained. . . .

RADIUM

Radium was discovered in 1898 by Professor and Madame Curie in a deposit of pitchblende from Joachimstal in Bohemia. Upon both animal and vegetable life radium has a decidedly detrimental effect, which is not, however, exercised equally upon all tissue cells, and even upon normal tissues radium has a decidedly selective action. Thus the cells of glandular structures, especially those of the ovary and testis, are much more susceptible than those of fibrous tissue, while muscle, cartilage, and

nerve cells are the least sensitive. Actively dividing cells are the most vulnerable, and the cells of malignant growths, in which activity of cell division is a prominent feature, are more readily affected by radium than the other cells of the body. Upon this selective action the therapeutic value of radium in cancer depends, and our problem is to determine the exact dose that will exert the maximal destructive effect upon the cells of the malignant growth with the minimal upon those of the other tissues. There is a minimal dose below which no destructive action occurs, and many believe that these weak irradiations can stimulate the growth of tumour cells, and even stir into activity cells actually quiescent. The total dosage of radium, calculated in milligram-hours, can be applied either as a large amount of radium acting for a short time, or a small amount acting for a long time, and opinion is not yet decided upon the optimal dosage for each type of growth. On the one hand, by prolonging the duration of exposure, a greater number of cells will be adversely influenced during the vulnerable stage of active cell division; on the other hand, it has been shown experimentally that repeated sublethal doses may actually increase the resistance of the tumour cell to radium, and radiation treatment should, therefore, be concluded within a reasonably short time, and not indefinitely repeated.

As a therapeutic agent radium has been found of considerable value in non-malignant conditions—such as nævus, keloid, lupus and other skin diseases, exophthalmic goitre, and benign tumours—but it is in the treatment of malignant disease (including rodent ulcer) that its chief interest to us lies. Restricted at first entirely to cases too advanced for radical operative treatment, its scope has within the last few years been extended, either alone or in combination with surgery, to the treatment of operable cases. There has arisen a special branch of surgical technique—"the surgery of access"—concerned with the planning of operative procedures for the appropriate exposure of deeply seated malignant growths in order that radium tubes may be placed in correct relation thereto—as when a rectal carcinoma is exposed by removal of the coccyx and lower portion of the sacrum, an œsophageal carcinoma through the posterior mediastinum

after rib resection or across the pleural cavity by lateral thoracotomy, or an intralaryngeal growth through a "window" cut in the thyroid cartilage. Modern methods of radium application have met with such considerable success in cancers of the skin, of the cervix uteri, of the mouth and tongue, and of the larynx, that there is an increasing tendency in these cases to prefer radium to operative treatment, at any rate so far as the primary growth is concerned. The comparatively slight disturbance of radium tube insertion, or of radium bomb treatment, their lesser risks, and the absence of that mutilation necessarily associated with a radical surgical operation, and which, as in the case of the tongue may prove a considerable and permanent disadvantage, are factors favourable to radium, and should tend to overcome the natural reluctance of the average patient to submit to early treatment. It is, however, upon the end-results that the question must be ultimately decided, and these are not yet sufficiently known in the case of radium for a conclusive judgment, although some promising series of five-year statistics have been reported. In many cases the best results are obtained by a combination of radium treatment with surgery, as when the radical operation for cancer of the breast is associated with the implantation of radium tubes or needles into the supraclavicular and anterior mediastinal regions. At the present moment expert opinion seems to favour reversion to the external application of radium, either alone or in combination with radium tube insertion and very short wave-length x-ray irradiation. There are, however, two most important changes from the surface applications as originally practised: (1) the much larger quantities of radium used—up to 4 grams, and (2) the much greater distance from the skin—as much as 16 cm.—at which it is applied, thereby ensuring a more uniform dosage to all parts of the area irradiated, with lessened risk of cutaneous damage. This "bomb" or "cannon" treatment—as at present carried out in Paris, Brussels, Stockholm, and on a smaller scale at the Westminster Hospital, London—is considered by many likely to prove the method of choice in radium therapy, and it certainly deserves to be tested very thoroughly, should a sufficiency of radium be forthcoming . . .

The technique of radium therapy is highly specialized, and such work should be centralized, and restricted to the expert staffs of special institutions established in a few of the largest cities of a country.

ACTINOTHERAPY

Heliotherapy—treatment by sunlight—is probably as old as human history. Hippocrates (460 to 370 B.C.) refers to the effect of sunlight in promoting health, and recommends sufferers from various ailments to walk about naked in the sun as much as possible—a simple remedy, which seems, however, to have been overlooked for many subsequent centuries.

At the end of the last century a considerable proportion of the beds in the hospital wards of our large cities was occupied with cases of tuberculous disease of the bones, joints, and spine, and other forms of "surgical" tuberculosis, for which operations, often of a very extensive and mutilating nature, and frequently requiring repetition, were considered the only chance of a cure. How frequently they failed, and, even when successful in saving life, the unsightly deformities and fearful defects of function that resulted are some of the unpleasant memories of those of us who practised at that time. No more beneficent change has occurred in any department of treatment than in that of surgical tuberculosis during the past quarter of a century.

Thanks to the pioneer work of Bernhard and Rollier in Switzerland, and of Sir Henry Gauvain and Sir Robert Jones in this country, these mutilating surgical operations are things of the past. Surgical tuberculosis is nowadays treated by a general exposure of the body to sunlight in the open air in summer, and to artificial sunlight in the winter or whenever natural sunlight is not available. This should be combined with local treatment so designed as to ensure complete immobilization of any active focus, the removal of any pressure or weight-bearing, the correction, so far as is possible, of any existing deformity, and the antiseptic care of any discharging sinuses. Active surgery is limited almost entirely to the evacuation of any cold abscesses that may develop, although in tuberculous spinal disease operations (Albee's, Hibb's) are occasionally performed, not as a direct attack upon the affected tissues, but to ensure better immobilization of the morbid focus

in the vertebral bodies by producing ankylosis of the spinous processes of the diseased vertebrae and of those immediately above and below. Under this modern plan of campaign not only is victory assured in a much greater proportion of cases, but the bronzed and robust-looking bodies of the patients under sunlight treatment contrast pleasantly with the waxen faces and wasted limbs of the old days, while the local focus of disease heals with the minimum of deformity and the maximum preservation of function.

Treatment by ultra-violet radiation (actinotherapy) is now being extended to rickets and other general diseases, to most forms of skin disease, and to many disorders of the circulatory, respiratory, alimentary, nervous, and genito-urinary systems, as well as to those of the special senses. It has, in fact, assumed the dimensions of a "boom" treatment, and "sun-ray" centres are being established all over the country, not only as private ventures, often controlled by laymen only, but also at the municipal bathing establishments of many of our cities and towns, while there are sunbaths in many factories and at "pitheads" in several of our coal-mining districts.

The ultra-violet rays are, however, far from being innocuous, and their correct dosage is a matter of great importance and of careful individualization, since what is a safe dose for one may be dangerous to another. Over-exposure to their influence produces sleeplessness, restlessness, loss of weight, lassitude, and even sickness, while severe burns and serious forms of dermatitis may result in sensitive persons. Moreover, some ailments are adversely influenced by ultra-violet ray treatment—notably chronic nephritis, arterio-sclerosis, and quiescent tuberculosis, the last of which may easily be stirred into renewed activity. It is therefore in the public interest that the prescription of ultra-violet rays be restricted to the medical profession, and that their application be undertaken only by those who have received a proper course of training for this special work.

The unqualified, unregistered chemist, dentist, and midwife are forbidden by law, and it seems only logical that the unqualified electrotherapist, who handles therapeutic measures equally potential of danger, should be placed under similar legal control.

PHYSIOLOGY

Physiology has often been referred to in the past as the handmaiden of medicine, but such a description very inadequately represents its present status as a proud and independent branch of true science—the science of life itself. Rather must it be described as the essential foundation of modern medicine and surgery, as the means by which many of our former purely empirical methods of treatment have been placed upon a rational basis, and as the main factor by which the practice of medicine and surgery is daily becoming proportionately more of a science and less of an art. That the element of art must continue permanently to play a considerable part in surgery is self-evident when we remember how largely handicraft enters into its daily routine, but the merely artistic aspect of surgery has now, we may fairly claim, been brought to so high a degree of perfection that it is not so much upon outstanding advancements in surgical artistry that we must rely for future progress as upon a more thorough understanding of the physiological principles involved in our work, and their application to what is, after all, the great aim of surgery—the restoration of deranged function to the normal. The greater comprehension the surgeon obtains of what constitutes normal function the better equipped is he to achieve this aim, and to improve his methods by means which were not possible in the days when physiology was less advanced. The surgeon and the physiologist must tread the path of progress hand-in-hand, to the great advantage of each, since the debt between them is essentially a mutual one. For the success of his experiments upon animals the physiologist has to depend largely upon the methods of modern aseptic surgery, and has, therefore, a very vital interest in any improvements in surgical technique that may from time to time accrue. Moreover, though it is true that many discoveries made by physiologists which have found valuable practical application in medicine and surgery have originated purely in the search after truth and without any thought of their possible clinical utility, yet, on the other hand, there are many instances where clinical observation has been the starting-point of physiological researches which have ultimately proved of the greatest benefit in the treatment of human disease. One of the most impressive illustrations

of this is yielded by the development of our knowledge of the localization of function in the cortex of the brain. . . .

The progress of physiology during the present century has been characterized by many new methods of study, by the greater attention devoted to human physiology, and by the enormous strides made in the physiology of nutrition. If we look back to the beginning of this century and compare the state of physiological knowledge then with that of the present day it is wonderful to contemplate the discoveries that have been made. The use of x-rays for the examination of the function of the stomach and small intestines, developed first of all by Cannon for physiological purposes, had only just begun to be applied to the diagnosis of alimentary diseases. The rôle of proteins in nutrition was imperfectly understood and their chemical constitution was only a conjecture. Vitamins had not been heard of. Insulin was still a hypothetical substance. None of the active principles of the ductless glands had been synthesized and their mode of action was very incompletely known. Micro-methods for the biochemical examination of the blood and other body fluids were practically unknown. The buffering mechanisms of the blood were not dreamt of, and the close interplay between normal physiological functions such as secretion and respiration, and their part in the regulation of body neutrality, was not known. The relation of the capillary circulation to the production of shock is also a relatively recent discovery.

All these advances in knowledge, and many others that might be mentioned, have had their influence on surgery—directly, because they have improved methods of diagnosis and treatment, and indirectly on account of their influence on the attitude of the surgeon to his subject. It is impossible to deal in detail with each particular advancement which surgery owes to physiology, but a few examples may be mentioned.

RICKETS

This disease, responsible for a large number of the deformities with which surgeons have been called upon to deal, may be expected to disappear within the next decade, as a result of the discoveries which have been made on the influence of vitamins, and especially vitamin D, on nutrition. It is a matter of congratulation that the pioneer work of Hopkins on the discovery

of vitamins, and of Mellanby on the dietetic factors which influence the development of rickets in dogs, was done in this country. The direct production of vitamin D is certainly the most important advance yet made in the chemistry of the vitamins, and has not only paved the way to a rational therapy of rickets, but, better still, has pointed out methods of prevention that should lead to its disappearance. Not only has this new treatment of rickets—the administration of concentrated vitamin D—an apparent advantage in point of time, but its great convenience, its exactness of dosage, and its economy are all in its favour. Before its adoption on an extensive scale, however, much requires to be known as to the stability of the new preparations, their keeping properties under various conditions, the exact dosage required for the cure of human rickets, and the possible dangers of excessive dosage. . . . [At this point the President dealt with the important subject of blood-transfusion.—Ed.]

INSULIN

Although the isolation of insulin and its preparation in a suitable form, standardized for therapeutic use, is a triumph of physiology which finds its greatest use to the physician in the treatment of diabetes, yet it has not been without its value to the surgeon. Diabetic patients require surgical attention proportionately much more frequently than non-diabetics, or than sufferers from other chronic diseases. Thus Fitz found that 14 per cent of 386 diabetics consecutively treated at the Massachusetts General Hospital required surgical intervention, chiefly on account of the frequent occurrence of carbuncle and of gangrene. Prior to the introduction of insulin a high mortality attended surgical operations in diabetes, mainly owing to slow healing of the tissues, to their increased liability to infection, and to the frequent development of post-operative coma; insulin administration, together with precision in diet, has so completely transformed the surgical outlook that, as reported from the Mayo Clinic in 1926, no patient is now refused any necessary operation because of diabetes, and the mortality of operations upon diabetes has been reduced to that in cases without this complication. It seems likely that in the future, with a better knowledge of the

part played by insulin in carbohydrate metabolism, it may find other uses. Its value in furthering the deposition of glycogen has already been applied to the improvement of the functional activity of the liver, and in cases of inanition which have to be operated upon it may be of value in rapidly inducing a better nutritive condition of body tissues; while the combination of glucose intravenously with insulin subcutaneously has proved of considerable value in the treatment of shock, creating an immediate supply of energy from the rapid oxidation of the glucose by insulin.

ASSESSMENT OF RENAL FUNCTION

It is principally to the painstaking and persevering work of the American biochemist, Folin that we owe the modern micro-methods of blood analysis whereby, using only a few cubic centimetres of blood, all the important constituents can be accurately determined. These methods have been particularly helpful in cases where prostatectomy is contemplated and where it is essential to know to what extent the excretory functions of the kidneys have been already adversely affected by back-pressure from the prostatic obstruction, as indicated by the abnormal retention in the blood of urea, uric acid, creatinin, and other waste products to an extent varying directly with the degree of renal derangement. It cannot, in fact, be too strongly stressed that the operative risks of prostatectomy are concerned infinitely more with the condition of the kidneys than of the prostate, and that by delaying the major operation until the renal functions have been improved by the relief from "back-pressure" afforded by adequate preliminary drainage of the bladder—either by the indwelling catheter or by suprapubic cystostomy—the dangers attending the removal of the prostate can be very materially diminished. Biochemists, by means of their tests of renal functional capacity, have enabled surgeons to estimate the power of the kidneys to withstand surgical intervention with a degree of accuracy that is truly remarkable.

Of other methods of applied physiology to which the surgeon is indebted, mention may be made of the use of fractional gastric analysis for investigation of the activity, both digestive and motor, of the stomach; the duodenal tube

for the collection and examination of bile; estimation of the basal metabolism as a guide to over- and under-activity of the thyroid and pituitary glands, and to the nature of the operative procedures to be undertaken in connection therewith; determination of the carbon dioxide combining power of the blood and its relation to the diagnosis of those conditions of acidosis and alkalosis that occasionally complicate surgical procedures; and the examination of the red blood corpuscles for "fragility" in cases of splenic enlargement, as in hæmolytic jaundice. Pregnant with promise, too, is the recent extension of physiological research to the whole field of human activity.

BACTERIOLOGY

Of modern surgery's debt to the other ancillary sciences that to bacteriology is assuredly the most fundamental, since it was Pasteur's discovery that fermentation and putrefaction were caused by minute living organisms and were, therefore, vital and not merely chemical processes, as hitherto believed, that led Lister to his great conception of the antiseptic treatment of that putrefaction then found in almost all wounds—a conception which constitutes, as we have seen, the very starting point of modern surgery. Time permits me merely to mention other advances in bacteriology: the detection of the causative germs of almost all the infective diseases; the enunciation of the great principles of immunity, both "active" and "passive"; the preparation of vaccines and of antitoxic serums and their use in the prevention and treatment of bacterial infections; the therapy of systemic infections by the intravenous introduction of chemical antiseptics resulting, among other notable gains, in that brilliant conquest of the former scourge of syphilis that has been achieved within the present century—all of which constitute mile-stones along the highway of bacteriology's triumphal progress.

Nor have I time to refer to the great help that modern surgery has received from research workers in anatomy, pathology, and pharmacology, valuable as their contributions have been; nor yet to more general sources of assistance such as the greatly improved means of rapid intercommunication—the telephone, the wire-

less—and of rapid transport—the motor-car, the aeroplane—factors which have so materially facilitated the prompt application of surgical relief in cases of emergency, whether on land or at sea.

I trust, however, that enough has been said to indicate that modern surgery, with the aid of its allies, has made and is still making great progress towards that end we all so fervently desire—the prevention of those abnormal conditions, the late results of which to-day necessitate so much surgical attention of a destructive rather than a constructive character. Much yet remains to be done, and the natural sciences must continue to advance, each ready

to assist and to accept assistance from its fellows, each along its own special path yet all in mutual friendly alliance working for the common good, all in zealous pursuit of that goal, unattainable though it must ever remain, that will-o'-the-wisp of perfect knowledge and complete understanding. In so doing they will but follow the precept and the spirit of that motto upon the crest of our beloved University, in whose venerable precincts this great Association will to-morrow enter upon its full scientific program, and of which we in this city are all so intensely proud; “*Arduus ad solem*”—“leaping upwards to the sunshine”—“ever striving towards the very highest.”

An Address

ON

THE MECHANISM OF THE DIURESIS PRODUCED BY INGESTION OF WATER*

By L. AMBARD, M.D., AND F. SCHMID, M.D.,

Strasbourg, France

IT is generally recognized that diuresis may result from a variety of conditions. This communication is concerned with the results of an investigation of the polyuric response to the injection of water. It is a well recognized fact that, in animal or man, when large quantities of water are ingested, polyuria rapidly results, particularly if the stomach be empty at the time of the experiment. The intensity of this form of diuresis may be such that, within an hour and a half, practically all of the ingested water may be eliminated.

Various explanations of this phenomenon have been offered. In 1912, Grinsberg† suggested that this diuresis could not be explained simply by the reaction of the body tissues to the addition of excess quantities of water. This view was supported by the observation that, though water when introduced into the alimentary canal leads to polyuria, the same quantity of water when administered subcutaneously or intravenously results not in

polyuria but in oliguria. In view of these findings, Grinsberg concluded that the ingestion of water leads to the liberation of some hormone from the intestinal mucosa and that this hormone has diuretic properties.

At the time Grinsberg offered the above mentioned hypothesis, an obvious difficulty which had to be overcome before accepting it was that water, when introduced into the alimentary tract, not only has to pass through the intestinal mucosa before its distribution throughout the body tissues but that it is also exposed to the action of the liver. Therefore, the possibility that the liver may be responsible for the resultant polyuria had to be considered. However, from the work of Pick and Molitor, in an entirely unrelated problem, the difficulty was somewhat simplified. These authors observed that, in dogs with *Eck fistulæ*, polyuria may follow the oral administration of water, and that this polyuria may not only be of the same degree as in normal animals but, at times, much more intense.

* Delivered at the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, June 21, 1929.

† *Arch. f. exp. Path. u. Pharm.* 69: 1912.

Repeated attempts have been made to verify the hypothesis put forward by Grinsberg. In

1912, Cowe prepared extracts from the intestinal mucosæ of dogs according to the technique then in use for the preparation of secretin. The material of the mucosa was macerated and the mass was acidified and heated for several minutes. After allowing the mixture thus obtained to cool, it was filtered and the filtrate was slightly neutralized. This neutralized filtrate, when injected subcutaneously into dogs, produced diuresis. That the polyuria thus obtained was not due to the diuretic action of the mineral content of the extract, was proved by the fact that when the extract was ashed and the ash was injected with a similar quantity of water, polyuria did not take place.

An attempt was then made to determine the site of action of this extract. When the kidneys were perfused with it directly, no diuretic action was obtained. When, however, the extract was allowed first to pass through the circulation of the head of the animal, polyuria resulted. Because of this observation, Cowe concluded that this form of diuresis was due to the liberation of a hormone from the tissue of the head of the animal and suggested pituitrin as the responsible agent. It may here be observed that, at that time, it was not known that the action of pituitrin was anti-diuretic.

In 1914, Hashimoto attempted to repeat Cowe's experiments, using the same technique as the English author. Hashimoto's results were diametrically opposite to those reported. Hashimoto noticed that a solution of the ash of the intestinal extract had as much diuretic action as the extract itself. He, therefore, concluded that an intestinal hormone with diuretic properties does not exist and that the theory put forward by Grinsberg had to be abandoned. Though Cowe did elaborate the theory it was by reason of an erroneous premise. Verney's observations (1925) were not then known. It was not known that pituitrin has no diuretic properties. In addition to this, we now know that the experimental results of Cowe were not due to the liberation of pituitrin.

In spite of the general confusion of experimental data, and with very little sound support for theory, we are left with the incontestable fact that polyuria results from the ingestion of water and that similar amounts of water administered subcutaneously or intravenously do not have the same effect. This phenomenon

must be explained and it is the results of a study of it that form the subject matter of this paper.

In our work we made use of a technique radically different from that of Cowe. This technique eliminated the necessity of the control experiment, which consisted of injections of watery solutions of the ash of the extract, the results of which led to disagreement between Cowe and Hashimoto. Our extract was prepared as follows:—

The material to be used was obtained from the mucosa of the first half of the intestinal canal of the cow. It was finely macerated and to it was added 40 c.c. of a decinormal solution of sulphuric acid and one litre of acetone for each kilogram of material. The mixture thus obtained was heated in a crucible for two hours at 79° C., cooled, and to the cooled mixture an amount of acetone was added corresponding to nine litres per kilogram of mucosa. With this technique, one obtains an abundant precipitate, and the final yield of material, obtained by subsequent fractional precipitation, is also abundant.

The basis of fractional precipitation is that extracts of organs contain different albumins, which may be separated by altering the p^H of the extract or its concentrations of alcohol and acetone. The precipitate first obtained is dissolved in an amount of water corresponding to 60 c.c. per kilogram of mucosa. The solution is slightly neutralized, the volume is noted, and to it are then added four volumes of acetone. The precipitate thus obtained is discarded. When an additional five volumes of acetone are added to the remaining material a new, though less abundant, precipitate is obtained. The residual acetone solution contains some substances in solution which can also be precipitated by neutralizing the remaining solution. This precipitate is viscous and maroon coloured. This portion of the extract is, however, not made use of.

According to the above mentioned technique, it is possible to obtain 0.3 or 0.4 grams of precipitate per kilogram of original material. By a second precipitation, however, conducted in a similar manner for purposes of purification, the final yield is only about 0.15 to 0.20 grams, and it is this purified substance which was used in our experiments.

The experimental animals were rabbits each weighing approximately three kilograms. During the experimental periods the animals were kept under the influence of either urethane (15 per cent solution in distilled water) or of chloralose (7 per cent solution in NaCl). The urines were collected by ureteral catheterization. The catheters were joined together by a horizontally placed glass tube of small bore. The urine volume output was expressed in terms of millimetres of urine obtained. The quantity of extract injected in each case depended upon the body weight of the subject, a definite amount being given per kilogram of body weight. Though the amounts of the extract varied with different subjects, in each case the total quantity used was dissolved in 1 c.c. of water. Injections were made, in the case of rabbits, in the vein of the ear.

EXPERIMENTAL RESULTS

Eleven experiments were performed upon rabbits and two upon men. In the first experiment, the injection of fourteen milligrams of the extract resulted in death of the animal in a few minutes. In a second experiment, the injection of six milligrams led to suppression of urine for such a length of time that the experiment had to be abandoned. In six other instances, two and one-half milligrams of the extract were used and in each case diuresis was noted. The diuresis made its appearance about two or three minutes after the injection. At the height of the polyuria, the urine volume output was as much as three or four times that noticed during the control period. In each case it was noted, however, that prior to the onset of polyuria there was a period of anuria of two or three minutes' duration. In two experiments, the injection of one milligram of the extract was followed by immediate polyuria of about ten minutes' duration. In the last experiment, the injection of one-fifth of a milligram of extract resulted in an immediate polyuria of five minutes' duration.

In man the extract was administered by the mouth. In the two experiments, the amounts given were one-half and one milligram per kilogram of body weight respectively, and they were dissolved in 10 to 20 c.c. of water respectively. No polyuria was noted.

Control experiments with extracts obtained from spleen and kidney were made. There was no diuresis.

The accompanying protocols of three typical experiments will give a fair idea in more detail, of the results we obtained.

EXPERIMENTAL DATA

Exp. A. Rabbit, weighing 3.2 kgm. Injection of 2.5 mgm. extract. Urine collected at five minute intervals.

<i>Time</i>	<i>Height of column of urine in millimetres</i>
5.20 p.m.	46
5.25 "	37
5.30 "	34
5.35 "	39
(Injection of extract at 5.36 p.m.)	
5.40 "	10
5.45 "	128
5.50 "	183
5.55 "	114
6.00 "	72
6.05 "	
6.10 "	50
6.15 "	36

Exp. B. Rabbit weighting 3.3 kgm. Two injections of intestine, each of one milligram, and an intervening injection of one milligram of spleen.

<i>Time</i>	<i>Height of column of urine in millimetres</i>
5.55 p.m.	55
6.00 "	50
6.05 "	37
(Injection of intestine at 6 p.m.)	
6.10 "	258
6.15 "	202
6.20 "	110
6.25 "	40
(Injection of spleen at 6.26 p.m.)	
6.30 "	30
6.35 "	24
(Injection of intestine at 6.37 p.m.)	
6.40 "	271
6.45 "	276
6.50 "	45

Exp. C. Rabbit weighing 3.2 kgm. Injection of 0.2 mgm. of intestine and a control injection of 1 mgm. of kidney.

<i>Time</i>	<i>Height of column of urine in millimetres</i>
6.25 p.m.	85
6.30 "	51
(Injection of kidney at 6.31 p.m.)	
6.35 "	36
6.40 "	46
(Injection of intestine at 6.41 p.m.)	
6.45 "	132
6.50 "	40

DISCUSSION OF RESULTS WE OBTAINED

If we set aside the experimental results obtained in man when the extract was administered orally, the remaining data lead to the conclusion that: (a) large amounts of this extract prepared from intestinal mucosa lead to anuria and even to death; (b) that lesser

quantities lead to diuresis preceded by oliguria; and (c) that very minute doses lead to polyuria only.

Since it is generally recognized that blood pressure is intimately concerned with renal secretion, our data obtained with regard to this phase of the subject are of interest. With the injection of one milligram of the extract there was noted a fall of blood pressure corresponding to about 30 mm. of mercury. The fall of blood pressure was transient. At the end of one minute it returned to its original level. With doses of three milligrams the fall of blood pressure was not any greater, but it was more persistent.

From the above observations it appears that the extract which we obtained by our technique was not a pure substance. It appears to contain a mixture of substances, some of which are responsible for anuria and shock. When large amounts of the extract are administered it would appear that the substances responsible for anuria and shock are present in such amounts as to counteract the action of the diuretic. The diuretic appears to be specific. We now know that the polyuria cannot be attributed to the ingested water itself, nor can it be attributed to the ash content of the extract. Controlled experiments with spleen and kidney tissue did not result in diuresis.

One cannot close this report without some speculation as to the possible underlying mechanism of this form of diuresis. If one were to accept the view that suppression of pituitrin secretion leads to polyuria, it might be suggested that diuresis following oral administration of water results from an inhibiting action of some hormone which originates in the in-

testinal tract and which counteracts the action of pituitrin. We believe that this hypothesis must be rejected, since the suppression of secretion of pituitrin is relatively a slow action, whereas the onset of the polyuria resulting from the injection of the intestinal extract occurs rapidly, namely, within about twenty seconds. In view of this observation, and also of the fact that the extract causes a fall, rather than a rise, of blood pressure, it is suggested that the action of this extract is directly upon the kidney cells.

In view of the above observations, our conclusion is that when water is administered by mouth it leads during its absorption into the body to the liberation of a hormone from the intestinal mucosa. This hormone is a diuretic and it produces polyuria by acting directly upon the kidney cells.

One can hardly close this discussion without some speculation. These findings appear to have some practical significance. In the usual water tests which we use for the estimation of renal efficiency we assume when an individual is given a large volume of water and no polyuria or a lessened polyuria results that this is due to impaired renal efficiency. May it, therefore, not be that in an individual with a nephritis there is some disturbance of the metabolism of the gastro-intestinal tract, and that this, and not impaired renal efficiency, is responsible for the absence of the polyuric response? In other words, here, again, we have a suggestion that in nephritis we are not dealing with a condition in which one organ only is disturbed, but with a general metabolic disturbance having a local manifestation in the kidneys.

PREGNANCY FOLLOWING AMPUTATION OF BOTH BREASTS.—Contrary to the view that there is some functional association between the breasts and the female genital organs, Leunckens and Pastiels report a case indicating that the mammary glands apparently exert no influence on the utero-ovarian apparatus. A woman, aged 37, had phlegmonous inflammation of both breasts soon after her confinement; all varieties of local and general treatment were ineffective. The blood culture showed a staphylococcal infection. The breasts continued to inflame and suppurate, and amputation of the right breast was therefore undertaken to save the patient's life. The general condition improved, and the left breast was accordingly removed. Recovery was uncomplicated. The

physiological results of the operation were awaited with interest. Menstruation was not affected in rhythm, duration, or regularity; the patient noticed faint prickings in the operation scars at the beginning of the menses. The genital feelings were unaltered. Eight months later the patient became pregnant and went to term without any noteworthy event. The accouchement was uncomplicated and the infant survived. The puerperium and the involution of the uterus were quite normal. Two later pregnancies occurred, but neither of these went to term. The authors, however, do not consider that the operation could have affected these remote events.—*Brit. M. J.* 2: 9, July 13, 1929.

BETTER RESULTS IN ACUTE INTESTINAL OBSTRUCTION DUE TO RECENT METHODS OF INVESTIGATION AND TREATMENT*

BY HERBERT A. BRUCE, M.D., F.R.C.S., (ENG.),

Professor of Clinical Surgery, University of Toronto,

AND

J. WINFIELD RUSH, M.B.,

*Demonstrator of Anatomy, University of Toronto,**Toronto*

THE prodigious amount of research work done in recent years on intestinal obstruction has resulted in a better understanding of the underlying problems connected with it, particularly in regard to the altered chemistry. As a consequence of this, as soon as the physician considers intestinal obstruction a possibility he should institute treatment for the relief of chloride deficiency. There is still, however, a very high mortality rate, due partly to the delay in calling a surgeon, estimated to occur in one-fifth of the cases, for which the family physician is not necessarily to blame, as he is frequently called late. Even though the surgeon knows in advance that these cases have not more than a 2 per cent chance of recovery he does not refuse to operate, as without it there would be 100 per cent death rate.

In this disease we are dealing with mechanical obstruction on the one hand, and damage to the bowel wall with the production of a toxin on the other, together with dehydration and its accompanying disturbance. It will, therefore, be readily seen that the longer the condition is allowed to persist the greater will be the damage to the bowel wall, and the more deranged the metabolic processes, so that a time must arrive when it is too late to expect anything from operation; for although the obstruction may be relieved, the production of toxic substances, and the damage to the bowel wall, may be so great as to prevent recovery. Much work has been done in an effort to discover the nature of this toxin, but up to the present it has not been demonstrated. Everyone agrees that it is not present in the normal intestine, that it has its

origin above the point of obstruction, and is probably caused by the disintegration of protein. Williams¹ suggests that the toxin is formed by the *B. Welchii*, but this has not been proven, nor has the toxin been shown to be due to any other organism. Whipple² thinks that a poison, which he believes to be a proteose, emanates from the intestinal mucosa when this is injured, but that it differs from it in that animals cannot be immunized against it. The experimental work of Wangenstein and Loucks³ showed that these toxic substances have an effect upon the body similar to that produced by histamine, one of the outstanding features of which is a great fall in the arterial blood pressure. Based on this fact numerous observers have experimented with histamine, but the results are not conclusive.

SYMPTOMS AND SIGNS

It is not the purpose of this paper to discuss all the clinical aspects of obstruction, but we may state briefly that the essential symptoms are: (1) vomiting; (2) pain of a colicky character; (3) stoppage of the bowels.

We should like here to utter a word of caution against the practice, all too prevalent, of giving frequent exhausting enemas of assorted varieties before calling a surgeon. In the early stage of an obstruction there will not be distension, and it should be possible to diagnose the condition before the distension becomes marked. Obstruction should be easily distinguished from perforation or an inflammatory lesion by the fact that in obstruction the abdominal wall will be soft, whereas in the latter there will be rigidity. A diagnosis of intestinal obstruction should always be made without the help of the laboratory. The latter

* A paper read before the Ontario Medical Association at its meeting in Hamilton, May, 1929.

will later be of assistance in showing the damage done. An x-ray is not necessary and should never be employed as an aid to diagnosis, as the delay entailed in obtaining one may prove disastrous to the patient.

The urine is always scanty, contains a slight trace of albumin, has a large increase in the non-protein nitrogen, a decrease in the chloride content, and often traces of phenol and indican. The changes in the blood are definite and easily determined. First, the chlorides are reduced; second, there is a rise in the non-protein nitrogen; and third, the carbon dioxide combining power is increased.

The laboratory can determine accurately the chloride content, the non-protein nitrogen content, and the carbon dioxide combining power of the blood. The amount of chlorides in the normal blood is fairly constant at 0.6 per cent. In cases of obstruction it will fall to half of this, or less. The chlorides are absolutely essential to life, every fluid in the body containing varying amounts, therefore the reduction of the amount in the blood seriously disturbs the equilibrium of the body's metabolism.

The non-protein nitrogen can be easily estimated in any laboratory and is due almost entirely to the increase in blood urea. We believe that this is distinctly helpful in enabling us to make a prognosis, and when excessively high we look for a fatal termination.

The term "alkalosis" is a relatively new one, the condition depends upon a disturbance of the acid forming radicals in the blood. These radicals consist largely of chlorine, bicarbonates, acid phosphates, and, to a lesser extent, sulphates. Chlorine is thought to make up 50 per cent of the total. One can easily see, therefore, that the loss of a large amount of chlorides will help to bring about this condition. The symptoms of alkalosis in animals are hyper-excitability and tremor. We are able to determine the amount of alkalosis by an estimation of the carbon dioxide combining power of the blood.

CAUSE OF DEATH

The fundamental cause of death is not known. Numerous theories have been put forward by a great number of workers. Although a toxæmia is present in these cases it has never been proven to be the cause of death. A

plausible theory is that advanced by Gamble and McIver,⁴ who consider that the water loss, with the accompanying loss of electrolytes, chlorides, phosphates and carbonates, is the prime factor. Gatch⁵ supports this view. Hartwell and Hoguet⁶ believe that death is due to dehydration only, to which view Wilkie⁷ subscribes. When one considers that the small intestines secrete seven to nine litres of fluid in twenty-four hours one realizes the seriousness of dehydration. Hausler and Foster⁸ give the cause as starvation.

TREATMENT

Let us see how the knowledge gained by laboratory examination can be used to treat the patient.

First of all, for the relief of hypochloræmia we can, obviously, administer salt. This can be administered either interstitially or by the continuous intravenous method, using normal salt solution, either with or without glucose. The use of continuous intravenous saline was first suggested and carried out by Dr. R. Matas,⁹ and has been successfully employed by Drs. Gallie and Harris¹⁰ at the Sick Children's Hospital, Toronto, for some years, the latter having devised a very simple apparatus which we have found most useful. For the relief of starvation, glucose solution given as described is our "sheet anchor." We have frequently been able to sustain patients by this method for periods of a week or two.

The treatment above indicated for hypochloræmia and starvation will also relieve the dehydration. If the fluid is given interstitially it is necessary to allow a small amount to run in steadily, rather than large amounts interruptedly, as the latter procedure is very painful to the patient. We have given interstitial solutions for many days at a time without producing sloughing or much discomfort.

We have found the administration of salt, glucose solution, or even water, into the distal end of an ileostomy to be useless, and agree with Haden and Orr,¹¹ Gatsch, Trusler and Ayers¹² that it probably shortens life. There is no doubt that the administration of water *per rectum* is of value. In children repeated transfusions are sometimes beneficial.

No therapeutic measure has been found to combat the increase in the urea nitrogen.

Nevertheless, the increased fluid administration, by stimulating the kidneys and the sweat glands, provides nature with a method of elimination. In cases of high obstruction, as there is always a good deal of regurgitation of the duodenal contents into the stomach, we drain the latter by means of an Einhorn tube. This may be left *in situ*, even in a child, for many days, and keeps the patient much more comfortable, as it permits of water being drunk freely; at a later stage the tube may be used for the administration of purgatives and nourishment directly into the duodenum.

In cases in which paresis of the bowel already exists, we have had good results from the use of an intravenous injection of 30 c.c. of a 30 per cent solution of sodium chloride. In spite of much objection to this measure, we have obtained such rapid and positive results that we shall continue to employ it.

A great many drugs have been recommended as adjuncts in the treatment of obstruction. With the exception of heart stimulants our field has narrowed down to two, *viz.*, pituitary extract and physostigmine. The action of pituitary extract is on the smooth muscle fibres of the intestinal tract, whereas physostigmine stimulates the vagus nerve, and through it the muscle and secreting cells of the mucosa. We have been employing these drugs in combination for some years, as recommended by Dixon in the *British Medical Journal*. We have had no result from the hypodermic use of any of the purgative glucosides. Brockman¹³ suggested repeated injection of bile into the rectum but we have not tried it.

OPERATIVE TREATMENT

A patient suffering from intestinal obstruction is never a good risk, therefore the least amount of surgery which will suffice should be done.

1. *Jejunostomy and Ileostomy*.—For drainage of the loop above the obstruction these procedures have in many quarters fallen into disrepute, perhaps, largely, because they were not done until the patient was nearly moribund. Jejunostomy is practised at the Mayo Clinic in high obstructions, and, we understand, with considerable success. We have had several cases whose recovery was undoubtedly due to jejunostomy. Very high obstructions of the

jejunum can be emptied by squeezing the contents back into the stomach and washing out the stomach, and in these cases the duodenal tube will be found of great advantage, as it enables one to drain the upper jejunum through the stomach.

Sir Frederick Treves, who wrote one of the best monographs that has ever been published on intestinal obstruction, states that after the obstruction has been found and relieved, the operation in advanced cases is not completed until the distended gut has been evacuated, and he considers that before the abdominal wound is sutured in such cases an opening should be made in the bowel above the obstruction, so that its contents may be readily discharged. By "advanced cases" may be understood those in which the operation has been delayed beyond forty-eight hours from the onset of the attack, and in which there is much distension and stercoraceous vomiting. The necessity of this will be seen when it is realized that in advanced cases the real danger to life is the presence of the poisonous material in the intestine and not the actual obstructing cause beyond its walls. This measure of treatment by evacuating the gut was vigorously advocated by Travers over one hundred years ago.

The best method of performing an enterostomy is by means of a Paul's glass tube of suitable size. In due course this artificial opening is closed by a second operation. The artificial opening is particularly fatal, however, in the case of infants and young children, and is to be avoided in cases of intussusception. We have been able to evacuate a greatly distended small intestine on several occasions by puncturing the first distended loop which presented in the small abdominal opening, and evacuating the contents into a basin. In one case (Case 4) it was possible to remove one hundred ounces in this way, and close the opening in the bowel immediately after. In a desperate case it will only be necessary to make a small incision in the middle line, and open the first distended loop which presents itself without searching for the obstruction.

2. *Spinal anaesthesia* has been used in the treatment of post-operative and other forms of ileus. It was first recommended by Wagner (Prag)¹⁴ for paralytic post-operative ileus, but is now employed by Leriche, Meyer, Duval, and

others for intestinal obstruction, no matter from what cause.

Chenut¹⁵ believes that peristalsis of the intestine is controlled by two centres, the medullary which is inhibitory, and the ganglionic, which is excitatory. Ileus, he considers, is produced by excitation of the peripheral nerves of the intestine and their action on the medullary centres. Spinal anaesthesia, by suppressing the inhibitory action of the spinal cord, permits excitatory action of the ganglia and promotes intestinal peristalsis. On the other hand, Lapointe only found spontaneous evacuation in 5 per cent of the cases in which he had used stovaine spinal anaesthesia.

In all cases, except paralytic ileus, although one obtained a result from spinal anaesthesia, an operation would still have to be performed to remove the cause of the obstruction.

Duval,¹⁶ after consideration of four hundred cases which he had collected, makes the following comments. (a) Spinal anaesthesia is contra-indicated in acute ileus should the patient be exhausted, toxic, or collapsed. (b) Spinal anaesthesia is not preferable to local anaesthesia in strangulated hernia. (c) Spinal anaesthesia is the method of choice in post-operative ileus, in which it is very frequently successful. Caeliotomy should invariably follow the satisfactory evacuation of the bowels brought about by spinal anaesthesia. (d) When successful relief of the ileus has been obtained by spinal anaesthesia, the subsequent operation is made easier for the surgeon and the patient alike, and the absence of distended intestine allows a more and more thorough investigation.

3. *Cæcostomy*.—This is of value only in obstruction of the large bowel, and, as it is a relatively simple procedure, should be employed in all cases. It provides a safety valve and an ideal method for the administration of fluids, as water is absorbed through the large bowel only. It should be done under local anaesthesia. The stomach should be washed out before performing any operation for intestinal obstruction.

4. *The use of the rectal tube*.—In cases in which it is not thought necessary to do a cæcostomy, the rectal tube will be found of great value. We got the idea of employing it from seeing Sir Arbuthnot Lane use it in ileo-colostomy, and observing how free these

patients were from distension. With the hand in the abdomen it can be manipulated through the sigmoid to the splenic flexure. As in the case of the duodenal tube, we have found this instrument of the utmost value, as by its use the sigmoid can be made an effective barrier to prevent the small bowel from getting into the pelvis; secondly, it provides immediate and positive drainage for the large intestine; and thirdly, it provides an excellent method for the administration of fluids and enemata.

5. In cases of gangrene of the small intestine, if the patient's condition does not seem sufficiently good to justify the removal of the gangrenous bowel, then it should be brought outside and left. It can be removed extra-peritoneally at a later date.

6. Where one is dealing with multiple adhesions involving a large area of the small intestine, it is often safer to do a lateral anastomosis, thus short-circuiting the involved area, or an ileocolostomy, rather than to attempt to separate the adhesions, which is a long and difficult task.

7. Resection of growths should never be attempted in the presence of pus.

We should like to give very briefly the history of a few illustrative cases.

CASE 1

B. H., male, aged 8. After being ill at home for five days without medical attention he was admitted into the Wellesley Hospital almost in *extremis*, with pinched face, bright cheeks, dry tongue, and muttering delirium. His abdomen was greatly distended, tender, and doughy to the touch; the pulse almost imperceptible and very rapid; and the breath loaded with acetone. He was given 5 per cent glucose solution intravenously and cardiac stimulants. After a few hours the abdomen was opened, a ruptured appendix removed, and a pint of foul smelling thin pus aspirated. The large bowel was greatly distended, the wall red and thickened. A cæcostomy was done and the abdomen drained in several places.

The post-operative treatment consisted of the continuous intravenous administration of 5 per cent glucose solution (in all, 4200 c.c. were given before the needle became plugged); drainage of the stomach by the duodenal tube; the administration of pituitrin and physostigmine; and the introduction of fluids through the cæcostomy tube. The urine was examined daily for sugar, and if any appeared a suitable amount of insulin was given.

He gradually improved, but later developed a left-sided sub-phrenic abscess, which was drained. Continuous intravenous glucose was again instituted and continued until 15,000 c.c. had been given. There was only slight thrombosis of the veins, which did no harm. Two weeks later an abscess was evacuated from the left side of the pelvis, the adhesions obstructing the colon released, and the cæcostomy closed. The use of the duodenal tube kept him comfortable and prevented vomiting, and through it he was given glucose and laxatives.

This boy was practically moribund when admitted with diffuse peritonitis, obstruction, and pronounced acidosis. We consider his recovery due (apart from the operative treatment) to; (1) the relief of starvation by the continuous administration of glucose intravenously; (2) the use of the duodenal tube; and (3) the cœcostomy, which helped to relieve the obstruction and gave an entrance for fluids.

CASE 2

V. S., female, aged 10. This little girl, who lives in Northern Ontario many miles from a railway station and twenty miles from the nearest physician, was taken ill with abdominal pain and vomiting, and her condition three days later, when first seen by the doctor, was so serious that he thought it too late for operation. She hovered between life and death for eight days, and was then brought to the Wellesley Hospital, when her condition was found to be very similar to that of Case 1. She was given 1000 c.c. of 5 per cent glucose solution intravenously, with 15 units of insulin.

After some hours the abdomen was opened, a ruptured appendix removed, and two quarts of pus aspirated. The intestines presented a dark reddish appearance. Drainage was provided, she was given glucose continuously by the intravenous method, and a duodenal tube was inserted.

She made satisfactory progress for nine days, when intestinal obstruction developed. Four major obstructions were found, one at the ileocecal valve, one at the duodeno-jejunal flexure, a third in the ileum about a foot from the cæcum, and the fourth in the pelvis due to an adherent coil of small intestine. A small collection of pus was also evacuated from the pelvis.

After this operation her pulse remained at one hundred and sixty for several days. Two weeks later a right sided sub-phrenic abscess was drained, from which she slowly recovered, and she is to-day as well as ever.

The duodenal tube was of immense value in the treatment of this patient as she refused to take albumin water or milk. It was left in for almost two weeks, being removed from time to time for throat gargle.

CASE 3

Mrs. S., aged 53. She had had two severe attacks of peritonitis in England twelve and ten years ago. She consulted us because of uterine hæmorrhage and obstipation, when examination disclosed large fibroids practically filling the pelvis. At operation the general peritoneal cavity was completely obliterated by adhesions between loops of small intestines. After an hour's careful separation of very dense adhesions the uterus was freed and removed. The appendix could not be found.

Following the operation the patient developed paresis of the bowel. Her blood chloride fell to 0.2 per cent, and her non-protein nitrogen was 92 mgm. She was given 5 per cent glucose solution by the continuous intravenous method. On two occasions 30 c.c. of a 30 per cent salt solution was administered intravenously, each time followed by bowel movements in a few seconds. After several days of anxiety the patient made a good recovery.

CASE 4

Mrs. M. M., aged 32. Hysterectomy, followed by intestinal paresis. She had persistent distension after hysterectomy for fibroids performed by another surgeon, accompanied by acute dilatation of the stomach necessitating frequent lavage. On the fourth day after operation, castor oil left in the stomach after lavage produced a free bowel movement, but only relieved the distension for a few hours. On the seventh day, under local anaesthesia in the patient's room, we re-opened part of the wound, took the first distended coil of small intestine which presented, and punctured it with a trocar, letting out one hundred ounces of fluid feces, when the whole intestinal tract collapsed. The bowel wall was so soft that the opening was closed with difficulty. There was no evidence of mechanical obstruction.

This procedure entirely relieved the patient and she made a good recovery.

CASE 5

Mrs. L. S., aged 25. This patient was operated on for a gangrenous appendix with diffuse septic peritonitis, when soft rubber tubes were used to drain the pelvis as well as the right kidney pouch. The patient progressed satisfactorily until the twenty-fourth day, when she suddenly complained of abdominal pain and vomited. As she had been eating strawberries and grapefruit twelve hours previously, the attack was at first attributed to this. However, twelve hours later she had another spasm of pain, when visible peristalsis could be made out. It was quite clear that she had developed mechanical obstruction, and an immediate operation was undertaken.

On opening the abdomen a mass of firm adhesions was encountered involving the terminal ileum and glueing this to the uterus, the right tube and ovary. These adhesions were carefully separated, when a second loop of small bowel was found adherent in the pelvis, causing an acute kink which completely shut it off. This adhesion was separated and the obstruction relieved. A small abscess was found in the pelvis behind some coils of small intestine. The rectal tube was passed up through the anus to the splenic flexure with the assistance of the hand inside the abdomen, and fastened in position by a suture to the skin of the buttock. This tube held the splenic flexure across the brim of the pelvis in such a way as to prevent the small intestines getting into the pelvis. She made a good recovery.

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THE KIDNEYS IN DIABETIC COMA*

BY I. M. RABINOWITCH, M.D.,

Montreal

THE kidney function in diabetes mellitus differs in no way from that found in normal individuals, providing that the disease is kept under control. This conclusion is based upon many hundreds of analyses. (Practically every diabetic admitted to the wards of this hospital has a complete examination, both clinical and laboratory, including a study of the kidney function). Of course, in the absence of proper treatment, with persistent glycosuria and hyperglycæmia, that is, when the disease is active, cardio-vascular-renal changes may occur.

In diabetic coma, traces of albumin and showers of casts are almost constantly found. In four cases only, of one hundred records selected at random, did we fail to find these abnormal urinary constituents. With the exception of its transient nature and the similarity between the urinary findings, the kidney lesion found in this form of coma does not correspond, clinically or anatomically, with the well recognized forms of acute nephritis, nor is it related to chronic nephritis. Before the days of insulin, when recovery from coma was extremely rare, this absence of relationship was proved by post-mortem examination. Since the advent of insulin, there is further proof, in the fact that as the diabetic recovers from coma both the albumin and casts sooner or later disappear entirely. The time required is, as a rule, about ten days. In our clinic, the shortest period noted was two days; the longest was four months.

The possible degrees of kidney damage may be seen both from clinical and laboratory studies. Complete anuria for a period of twelve hours may be met with, and marked oliguria may extend over a period of two or three days. Retention of non-protein nitrogenous constituents of the blood is not uncommon. As far as the writer is aware, John¹ has reported the highest blood urea nitrogen

value found, namely, 255 mgm. per 100 c.c. of blood. The highest in our clinic, in the absence of a previously existent chronic nephritis, was 101 mgm. The renal condition may be sufficiently severe to lead to all of the typical signs and symptoms of uræmia, and even to death, regardless of control of the acidosis, though, as Joslin states, this seldom occurs. As with most *acute* lesions of the kidney, marked urea retention does not necessarily indicate a grave prognosis. John's patient recovered.

The chief cause of this condition is probably, as Joslin suggests, damage of the renal cells by the acetone bodies. This may, however, not be the only factor. An analysis of our cases, both before and since the advent of insulin showed that though the incidence of albuminuria in the two groups did not differ greatly, the degree of anuria and retention of blood urea has been greater since insulin. Joslin's experience² appears to be somewhat similar in this respect. This author suggests that large doses of insulin may be a contributing factor. That insulin in some way may affect the kidneys is further suggested from two phenomena now generally recognized in some insulin-treated patients, namely, (a) œdema of the body tissues, and (b) raised renal thresholds with regard to glucose.

In the writer's experience, the degree of anuria appears to have been related not only to the dosage of insulin but also to the method of its administration. Insulin given intravenously appears to have led to greater degrees of anuria. It is, however, the ideal method of administering the drug to patients in coma, since the first object of treatment is the rapid restoration of the patient to consciousness.

A guarded prognosis is necessary when, in the absence of hypoglycæmia, drowsiness persists, in spite of the disappearance of the acetone from the breath and urine, and when the blood of such patients shows marked urea retention. With recovery from coma, the blood

* From the Department of Metabolism, The Montreal General Hospital, Montreal.

urea may rapidly return to the normal level; on the other hand, it may continue to increase for days, though the patient may have fully recovered from the coma.

Until recently we have had what appeared to be a reliable index of prognosis in the diazo-colour reaction made use of in uræmia. We, as well as others, have never found the reaction in any condition other than nephritis. Since our first experience with this test³ we have found it of particular value for prognosis in *chronic* nephritis. Individuals suffering from acute lesions of the kidney, such as acute nephritis, mechanical obstructions to the urinary outflow, etc., and whose blood at times gives the reaction, may recover; but we have yet to observe an individual with chronic nephritis who has recovered when the kidney lesion has progressed to the point of giving such a reaction. Further studies⁴ have shown that the reaction is more related to the creatinine than to the urea content of the blood.

A positive diazo-colour reaction in diabetic coma was first reported by Gordon, Connor, and Rabinowitch.⁵ The patient died. Since then all of six patients whose blood gave the reaction also died. Five of these individuals had chronic nephritis. Three of these five reacted well to insulin. Of the two remaining patients, one also reacted well to insulin. In other words, of these seven patients, it appears that four had renal lesions sufficient to lead to death and one of these was not a nephritic prior to the onset of the diabetic coma.

The following case was recently met with and is cited for two reasons, namely; (a) as an example of the possible course of events in such cases, and (b) because of the exceptional experience with the diazo-colour reaction.

A male, 35 years of age (Hosp. No. 5996/28) was admitted to the Montreal General Hospital, on October 18, 1928.

With the exception of his illnesses during the last twelve months prior to admission, his personal history was irrelevant. His family history was also irrelevant.

He was apparently perfectly well until one year prior to his admission, when he first observed that his appetite became ravenous. Since May, 1928, he had noticed polyuria, thirst and loss of weight. During the same time he had also had night sweats, occasionally pain in the chest, and had "coughed blood" at various times. On the day prior to admission (October 17, 1928), because he felt very weak, he thought he would try a large quantity of gin. Since it gave him no relief, he applied to the out-door clinic.

On admission, he had the usual features of the pre-comatous state of diabetes, including albumin and casts in the urine. The findings during the physical examina-

tion were otherwise negative. He received the necessary treatment, dietary and insulin, and, on November 7, 1928, was discharged from the hospital and referred to the out-door diabetic clinic. On discharge, he was well, except for the diabetes. The latter was under fairly good control. The urine was free of sugar and acetone bodies and contained no albumin or casts. (On the day prior to discharge, a faint trace of albumin was found, but there were no casts). The blood findings were as follows: Urea nitrogen, 17 mgm. per 100 c.c.; creatinine, 1.83 mgm. per 100 c.c.; sugar, 0.161 per cent; cholesterol (plasma), 0.264 per cent. There were none of the usual signs, clinical or laboratory, to suggest chronic nephritis.

Except for the gain of body weight, the findings during his subsequent weekly visits to the out-door diabetic clinic were not satisfactory. His home environment was such that proper diabetic management was practically impossible, in spite of the efforts of our Social Service Department. Glycosuria, though traces only, and hyperglycæmia, were frequently noted. He was last seen in the out-door clinic on January 8, 1929. On March 13, 1929, he was readmitted to the hospital.

On admission this time he was in coma and had the usual clinical and laboratory features of that condition, with the exception of the blood urea nitrogen; it was 35 mgm. per 100 c.c. He received one hundred units of insulin intravenously. The response was poor. Two hours later, the degree of coma, the respirations, the acetone odour, and other clinical features were unaltered. The blood sugar had increased from 0.588 per cent to 0.714 per cent. Fifty units of insulin were then given subcutaneously. One hour later there was some evidence of recovery. The subsequent events are of little interest with regard to the present discussion, except that from 8.30 a.m. March 13th, to 4.00 p.m. March 14th, he received 375 units of insulin.

On March 14th, at 4.00 p.m. the patient was obviously out of coma. The urine was free of sugar and acetone bodies, and the blood sugar was below normal, namely, 0.066 per cent, but the urea nitrogen had risen to 59 mgm. and the creatinine to 3.52 mgm. per 100 c.c. The diazo-colour reaction for uræmia was positive for the first time. On the following day the urea nitrogen was 67 mgm. and the creatinine was 4.10 mgm. per 100 c.c.; the diazo-colour reaction was strongly positive.

On March 16th, at 6 a.m. there was a marked change in the clinical picture. The patient complained of severe headache, developed dyspnœa and became drowsy. The urine at that time was free of sugar and acetone bodies but the blood sugar was 0.769 per cent. At 9 a.m. the blood sugar was 0.825 per cent. The urea nitrogen was 81 mgm. and the creatinine 5.66 mgm. per 100 c.c. So far as I am aware, this is the highest blood sugar record in the absence of glycosuria. The dyspnœa was paroxysmal in character and corresponded to the uræmic rather than to the diabetic type.

In view of the obvious renal block it was thought possible that just as the kidneys failed to excrete sugar, they also might have failed to excrete acetone bodies, and that the condition was probably diabetic coma. Wishart's test for acetone in blood was, however, negative. The sensitivity of this test is supposed to be about 1:20,000. The condition was therefore regarded as uræmia. He was given hot packs which led to improvement. The nurse's notes record the fact that the reaction to the hot packs was good. There was profuse perspiration and the headache was relieved. In view, however, of the marked hyperglycæmia the dosage of insulin was also increased.

During the afternoon of that day he was seen by Dr. A. H. Gordon who made the following note: "My impression is that this man has not got a chronic nephritis, but his present state is due to diabetic coma with a possible renal poisoning from the diabetic condition."

In another specimen of blood obtained that after-

noon, Wishart's test for acetone was again negative. During the two following days the renal lesion became worse. The headache returned and the urea nitrogen and creatinine were 91 and 98 and 5.45 and 6.97 mgm. respectively. On both of these days, the diazo-colour reaction was strongly positive. The reports with respect to albumin in the urine were "plus plus" and "plus" respectively.

On March 20th, there was both clinical and laboratory evidence of improvement. The urea nitrogen was 84 mgm. From then on improvement was progressive. On March 25th, the urea nitrogen was 17 and on March 27th it was 11 mgm. The urine, however, still contained a trace of albumin and an isolated granular cast. On April 2nd, the patient was discharged from the hospital, "well", with the exception of a trace of albumin in the urine.

COMMENT

From the above it will be observed that a positive diazo-colour reaction when found in the course of diabetic coma does not necessarily indicate an unfavourable prognosis. The kidney lesion in this condition, severe as it may at times be, appears, so far as prognosis is concerned, to correspond to the many acute lesions met with clinically and which as a rule terminate favourably.

The disturbances of kidney function in diabetic coma may be summarized briefly as follows:—

1. No albuminuria (no disturbance). This is extremely uncommon.

2. Albuminuria

(a) without urea-retention.

(b) with urea retention. When this occurs the course of events may be as follows; (1) Recovery to the normal level after the acidosis has been controlled. (2) Progressive impairment for some days with eventual recovery. (3) Progressive impairment leading to uræmia. With uræmic symptoms, the patient may at times recover.

A guarded prognosis is necessary when, in the absence of hypoglycæmia, drowsiness persists in spite of the disappearance of the acetone from the breath and urine, and when the blood of such patients shows marked urea-retention.

In diabetic coma, as in all acute lesions of the kidney, a positive diazo-colour reaction does not necessarily indicate an unfavourable prognosis.

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ERYSIPELAS IN CHILDREN*

By H. B. CUSHING, M.D.,

Montreal

THESE notes are based on the observation of cases of erysipelas treated during the past five years in the wards of the Alexandra Hospital for Contagious Diseases in Montreal. About 100 cases of this disease are treated each year in the wards of the Alexandra Hospital, and they may fairly be said to force themselves on the attention of the staff of the institution. They give more trouble and require more attention than any 300 other cases. Most of them are delirious for days. The aged and the infants, which between them make up the majority of the cases, mostly die. Every member of the staff wants to treat erysipelas in a different way, most methods of treatment

being troublesome, disagreeable, and expensive. The cases look so repulsive, seem so seriously ill, and are so apt to relapse when they are apparently cured, that altogether they are a source of affliction to the institution. In the endeavour to draw some conclusions as to the course of the disease in children, the case reports of all children under twelve years of age treated in the Alexandra Hospital during the past five years, some 80 in all, have been collected and analyzed and give the following results.

First, as to age. It is rather surprising to note the great susceptibility of young infants to the disease; 39 of the 80 cases were under one year of age, *i.e.*, erysipelas was nearly ten times as common in the first year of life as in any other year of childhood. Also, this occurred in spite of the protected life of the

* Read at the meeting of the Canadian Society for the Study of Diseases of Children held at Vancouver, June, 1928.

infant, which should not have exposed it to infection. There was the greatest variation in the severity of the cases, some being profoundly toxic and ill, and others running a very brief and benign course.

Clinically they could be divided into three fairly distinct groups. First: facial erysipelas, usually quite toxic, with high fever and delirium, but running a brief course, ending with a sharp crisis, and practically all the patients recovering. Second: those affected in one extremity only, usually, one leg, less toxic and also benign, practically all recovering in a brief period. Third: those in which the body was involved, the worst group of all, with a very high mortality and usually a prolonged irregular course. These three forms are almost like different diseases in their clinical course and prognosis, reminding one of the clinical difference between nasal, laryngeal, and faucial diphtheria. Now, it is very noticeable that the infants under one year of age develop almost always erysipelas of the body, while children over a year are practically in the same proportion as adults, *viz.*, 80 per cent facial; 10 per cent of one extremity, and 10 per cent of the trunk. Thus, of the 80 cases in question, 39 were under a year, and of these 30 showed involvement of the trunk with 60 per cent mortality. In only 9 was the disease limited to the face or extremities, and of these only one died.

Next as to infection. Erysipelas is obviously a contagious disease, due to several strains of streptococci, and responsible for terrible hospital epidemics in the past, but it is a striking fact that of all the 80 cases only 2 gave any history of possible exposure to any other case. More than 20 of them came from institutions where no other case had occurred and in which no other inmate contracted it. In other words erysipelas might be classed with pneumonia, so far as infection goes. Either the germs are widely prevalent and only cause the disease under certain circumstances, or else ordinary streptococci may cause a specific reaction under favourable conditions.

It is surprising how often erysipelas in children is secondary to some other pathological condition. In adults it is, of course, recognized that the specific streptococci enter through a wound but practically this portal of entry is seldom recognizable. However, in the

80 cases under discussion, in the vast majority the disease arose from some other condition, *e.g.*, otitis media, mastoid operation, wounds of the extremities, infected varicella pustules, impetigo, burns, vaginitis, chronic discharging sinuses, etc.

But it is the treatment of the disease which is of the greatest practical importance. There have been more methods of treatment advocated for erysipelas than for any other disease, even more than for whooping-cough, which is saying a good deal. There seem to be two main reasons for this. Firstly, erysipelas has an irregular course with an abrupt ending, and this favourable termination is apt to be ascribed to the last treatment used; and, secondly, the lesion is superficial, open to inspection, and it seems natural to expect that something could be applied that would arrest or cure it.

Anyone following a large number of cases of erysipelas soon reaches the conclusion that no drug treatment is curative, that nothing given internally influences its course, neither ergot, tincture of iron, nor quinine. Also, that nothing applied locally will stop its spread, neither carbolic acid, mercurochrome, corrosive sublimate, iodine, x-rays, nor ichthyol. Some of these may cause temporary relief, but a great deal of danger and discomfort to the patient may result if they are injudiciously applied.

If this general principle is recognized, much can be accomplished by treating the disease like any other acute specific fever, like measles, pneumonia or typhoid. In other words, general care and careful nursing, with the usual symptomatic and supporting treatment can help the patient a great deal, with, locally, only the use of some soothing lotion or ointment, abandoning all idea of abortive treatment by local application.

The hope for future advance, as in the case of most acute infections, seems to lie in the discovery of some specific antiserum. Our steps in this direction so far have been slow and stumbling. The first attempt was the use of polyvalent antistreptococcus serum. This had a few successes but there were so many failures that finally all abandoned it. The next effort was the use of blood transfusions in the

hope that the blood of the donor might contain antibodies. With this again there were a few brilliant successes but a great many failures. The use of transfusions from convalescent patients, or of convalescent patients' serum, had more to recommend it and has been extensively tried. This method has two drawbacks, which are encountered in the use of all convalescent sera, *e.g.*, in scarlet fever and in measles. First, there is the difficulty in obtaining it; and, secondly, the impossibility of standardizing it. Sometimes it appears to be effective and in other cases that obtained from other convalescents seems to have no antitoxic value; so the general results have been equally disappointing.

Finally came the recent introduction of specific antistreptococcus serum, prepared from the organisms of erysipelas in the same way as the scarlet fever antitoxin and standardized by the use of the skin-test with toxin. The introduction of this serum has been largely due to the investigations of Dr. Birkhaug and of Dr. Amoss. Probably most physicians in America have tried it, as all have been furnished with innumerable advertisements regarding it, usually accompanied by the most extravagant claims. There are various reasons why one should not expect too much from such a serum. Erysipelas has been known for years to be due to many different strains of streptococci; the

immunity it produces is most evanescent; the symptoms and complications of the disease are not so much due to a toxæmia as an actual inflammation and invasion of the tissues; and lastly the toxin skin-test seems most uncertain and unreliable. The serum from various sources has been used in the Alexandra Hospital in all cases of erysipelas for the past year and on the whole the results have been very disappointing. The mortality for the year in all cases of erysipelas, both children and adults, was 8 per cent; for the previous year, with almost the same number of cases, all treated without serum, it was exactly the same. There were a number of cases where the serum appeared to have striking results, producing a prompt arrest of the disease, but these were all cases involving the face or one extremity only. In no single case of erysipelas of the trunk in an infant was any definite effect of serum noted, yet these cases cause almost the whole of the mortality from the disease.

However, the fact that a certain number of cases react to serum, when given early in the disease, gives hope for the future, if the serum can be made more polyvalent, or some more accurate method of standardization can be discovered, but at present those who expect to get marked results from the use of serum in infants with generalized erysipelas are doomed to disappointment.

ETHYLENE AND OXYGEN ANÆSTHESIA.—Dr. H. P. Fairlie (Glasgow), in a paper on ethylene anæsthesia, said it could justly occupy a place among the regular methods of anæsthesia. If due care were taken to avoid cyanosis it was a safe anæsthetic. In the results obtained ethylene and oxygen closely resembled N_2O and oxygen; but there were two important differences. Ethylene produced a more profound anæsthesia, and was thereby rendered applicable to a wider range of operations. The second difference, an unfavourable one, was its unpleasant odour, not so much from the patient's point of view as for those who were working near it. The induction of anæsthesia was quite pleasant, though preliminary medication with morphine and hyoscine was desirable. The gas was rapid in its action and excretion, and after-effects as a rule were negligible. From the surgeon's point of view the main criticism lay in lack of muscular relaxation, and hæmorrhage. In operations where neither of these was of serious moment ethylene was adequate. The anæsthetist was working within fairly wide limits

of safety, and ample warning of danger was always given by cyanosis. The gas could be given by means of any good gas and oxygen apparatus. Ethylene was very inflammable, and great care was needed in handling it. If rigid precautions were taken, however, he could see no reason why it should not be used. For many cases he considered it to be the anæsthetic of choice. Dr. K. B. Pinson (Manchester) referred to his experience of ethylene in dental work. In some cases where N_2O had failed to produce satisfactory anæsthesia, ethylene had been successful. The considerable amount of oxygen which could be given with it rendered it safer in some cases than N_2O . The one thing against it was its inflammability. The ignition point of ethylene and oxygen was very low. Dr. C. F. Hadfield drew attention to the valuable work done by Professor H. B. Dixon at Manchester University on the ignition points of anæsthetic mixtures. The explosibility of ethylene had been specially studied.—*Brit. M. J.* 2: 253, Aug. 10, 1929.

THE ELIMINATION OF RICKETS IN ONTARIO*

BY FREDERICK F. TISDALL, M.D.,

Toronto

THE incidence of rickets has diminished markedly in Ontario during the past ten years. The marked manifestations of the disease, as shown by the infant who successively develops restlessness, sweating of the head, general loss of muscular tone, cranio-tabes, enlargement of the epiphyses of the ribs and long bones, and finally bone deformities such as knock-knees and bow legs, are now rarely encountered. In fact I can recollect having seen only one case with marked bone deformities in the infant wards of the Hospital for Sick Children during the past four years. Even cranio-tabes and evident enlargement of epiphyses are seen so infrequently as to constitute a real problem in the education of our medical students. Ten to fifteen years ago infants with this condition were encountered with singular regularity throughout the winter months. What factors have been at work to produce this marked reduction in the incidence of rickets in Ontario?

Sunshine and Skyshine.—Probably the most important agency for the prevention and cure of rickets is ultra-violet rays from natural sources, that is ultra-violet rays from sunshine and skyshine. Sunshine, and the reflected rays from the sky designated as skyshine, are composed of: (1) heat rays which are longer than 760 millimicrons in length (the unit of measurement, the millimicron, is one ten-millionth of a centimetre in length); (2) visible rays, which vary in length from 760 millimicrons, which we see as red light, to 380 millimicrons, which we see as violet light; and (3) invisible ultra-violet rays which extend down to 290 millimicrons. Only the rays shorter than 313 millimicrons in length produce an antirachitic effect. Thus the rays effective in the prevention and cure of rickets are the very shortest rays in sunshine. These rays, which are now known to be essential for life, constitute considerably

less than one-tenth of 1 per cent of the total solar radiation.

During the past three years we have studied the variations in the anti-rachitic effect of sunshine throughout the year.¹ As was to be expected, we found that winter sunshine has only a slight antirachitic effect. A sudden increase occurs, however, as soon as the sun reaches a maximum daily altitude above the horizon of 35 degrees.² In Ontario this increase occurs between the middle and end of February, and continues until about the middle of October. During this period of the year sunshine has a very marked antirachitic effect, an effect roughly eight times as great as during the winter period from the middle of October to the middle of February.

A study was made of the antirachitic effect of skyshine and rather to our surprise we found that these rays from the sky have almost exactly the same value as the direct rays from the sun.³ This means that ultra-violet rays from natural sources are obtained one-half from skyshine, the reflected rays from the sky, and one-half from the direct rays of the sun. The value of the skyshine throughout the year was found to vary the same as sunshine, that is it has a much lower value from the middle of October to the middle of February than during the remainder of the year.

These facts explain the almost complete absence of rickets during the summer months. During this period of the year almost every infant gets outside for some part of the day, and even if the patient receives only skyshine an effect is produced which, although less than optimal, is still sufficient to prevent the occurrence of rickets. There is little doubt that the general education of the public as to the value of sunshine and skyshine as a means for the prevention and cure of rickets has aided materially in the reduction of the incidence of this disease in Ontario.

* Read at the forty-ninth annual meeting of the Ontario Medical Society, Hamilton, May 29, 1929.

Special Ultra-Violet Transmitting Glass.—

Skyshine or sunshine which has passed through ordinary window glass produces no antirachitic effect, as ordinary glass cuts off all rays shorter than 320 millimicrons in length. Special glasses are now available which will transmit a portion of the effective rays.⁴ Although when new most of these glasses transmit from 70 to 80 per cent of the effective rays they rapidly deteriorate and at the end of six weeks transmit only from 25 to 45 per cent, at which level they remain constant. In considering the use of these glasses it must be remembered that the amount of ultra-violet rays available is very slight during the late fall and winter months. The chief use of these glasses then is during the latter half of February, March, April and May, during which time the sun's rays are very potent, but on account of our inclement weather it is practically impossible to expose any considerable area of our patients' bodies to the outside elements.

In order to obtain the most value from the use of ultra-violet transmitting glasses it is necessary for the patient to be in the direct rays of the sun which have passed through the glass. From the results of our experiments it can be mathematically calculated that a patient so situated will receive 12 to 15 per cent of the benefit he would receive if he were similarly exposed outside on the sunny side of the street. Of course it must be remembered that during the spring months only the patient's hands and face can be exposed outside, while inside, protected by this glass, the whole body can be exposed. This more than makes up for the reduction in the amount of rays available inside.

In regard to the value of special glass in north windows from our experiments it was found that a patient situated three to five feet from an ordinary sized window glazed with special glass, and receiving only skyshine through it, obtained about one-half of 1 per cent of the effect he would have obtained had he been placed outside on the sunny side of the street, and about 1 per cent of the effect had he been outside on the shady side of the street.

It is thus evident that in order to obtain much benefit from rays which have passed through special ultra-violet transmitting glass

the patient should either lie in the direct rays of the sun with all or the greater portion of the clothes removed, or in a solarium exposed to rays from all the sky. In addition it should be remembered that the greatest effect is obtained at the middle of the day when the sun is at its height.

Other Antirachitic Factors.—As already stated the antirachitic effect of sunshine and skyshine is markedly reduced during the fall and winter months, and it is during the winter months that rickets is most frequently seen. What other means have we to prevent this disease? Briefly, there are three methods which we may use: (1) the exposure of the patient to ultra-violet rays from an artificial source such as the mercury quartz or carbon arc lamp; (2) the liberal administration of cod liver oil which contains the antirachitic substance or vitamin known as ergosterol; and (3) the administration of the activated ergosterol itself.

Mercury Quartz and Carbon Arc Lamps.—Ultra-violet therapy by means of the air-cooled mercury quartz lamp or carbon arc lamp is singularly effective in the prevention and cure of rickets. The quartz lamp is many times more efficient than the carbon arc lamp, but this does not mitigate against the value of the latter as the duration of the exposure may be increased to overcome this difference. The use of ultra-violet therapy from an artificial source, however, will never become an important factor in the prevention of rickets on account of the cost of the lamps. These lamps should be regarded simply as useful adjuncts to the other methods at our disposal. With certain severe cases of rickets which respond slowly to other methods of treatment they are most valuable.

Cod Liver Oil.—Cod liver oil has been used for many years for the prevention and cure of rickets. It is not the oil itself which produces the beneficial effect, but the antirachitic substance or vitamin which it contains. The concentration of this vitamin varies tremendously in different samples of oil; in some individual fish it is as much as 1,000 times as potent as oil from other fish.⁵ Practically all the oils on the market now are biologically tested in order to ensure that the product does produce the antirachitic effect desired.

The widespread use of biologically tested cod liver oil has been a most important factor in

the reduction of the incidence of rickets in Ontario during the past ten years. Through the efforts of physicians, public health departments and other organizations, a mother is now rarely encountered who does not know that cod liver oil is of value for her infant. An erroneous impression which is still widespread however, is that rickets does not occur in breast-fed infants. This is contrary to fact, for we see just as severe rickets in breast-fed as in bottle-fed infants. All infants, whether breast-fed or not, should receive cod liver oil, starting at one month of age. The amount should be gradually increased from ten drops three times daily to one teaspoonful three times a day by the time the infant is two months of age. Dr. Martha Elliot recommends that two teaspoonfuls be given twice a day, as she found on account of the spoon rarely being completely filled that the infant received only an average of three teaspoonfuls a day. Three drams daily is sufficient in practically all cases to prevent or cure the disease. The oil should be continued for at least two years and after that it will be found to be a useful winter tonic throughout childhood.

The disadvantages of the administration of cod liver oil are the rather objectionable odour, the fact that the oil stains the clothes, and that many infants are unable to take the oil without vomiting. The best time to give cod liver oil is just before feeding. As many infants object to cod liver oil it frequently has to be administered forcibly. To obviate this difficulty with bottle-fed infants Goldbloom recommends the following procedure which he has found eminently successful:

"After the food formula has been made up take three teaspoonfuls of cod liver oil and two or three teaspoonfuls of ordinary white flour and blend in a saucepan. Then over a gentle gas flame add several teaspoonfuls of the formula, allowing it to thicken into a creamy consistency. Then add a cupful of the formula, mix thoroughly, and allow to boil for ten minutes. Add this to the entire formula for the day."

Irradiated Ergosterol.—One of the most striking discoveries of medical science made during the past five years is the observation that a substance known as ergosterol can be so changed or activated by exposure to ultra-

violet rays that when fed to an individual it will prevent or cure rickets. The potency of the substance is most remarkable. One ten-thousandth of a milligram fed daily to a rat on rachitogenic diet will prevent the development of rickets. In fact it has been calculated that one ounce of activated ergosterol has the same antirachitic effect as 2 to 6 tons of good cod liver oil.⁶ The substance is now being made commercially and dissolved in vegetable oils, so that two drops produce the same antirachitic effect as one or two teaspoonfuls of cod liver oil. There is little doubt that the use of this substance in a suitable dosage will be a most effective means for the prevention and cure of rickets.

The question arises "Are there any dangers to the administration of ergosterol?" Like every other potent drug tremendous doses are quite toxic. Pfannenstiel⁷ Kreitmaier and Moll⁸ Klein⁹ and Shohl¹⁰ have shown that when animals are given 50,000 to 100,000 times the minimum preventive dose they lose weight and die. Examination of the tissues shows parenchymatous degeneration and calcification of the blood vessels, kidney, heart, stomach and other organs. Shohl¹¹ has given 20 times and Hess¹² 100 times the average dose with no harmful effects. It would appear therefore that suitable doses of ergosterol may be used with no untoward results.

Irradiated Food Substances.—As ergosterol is present in many food substances such as grains, milk, etc., irradiation of these foods results in the development of antirachitic properties. Commercial firms are now starting to market irradiated foods. The medical profession will do well to obtain authoritative information as to the amount of the antirachitic substance present in these foods, not so much on account of the possibility of giving an overdose of irradiated ergosterol, but rather on account of the possibility that the amount of ergosterol contained will be so small as to produce only a very slight antirachitic effect. Unless the medical profession keep these points in mind we may be lulled into a false sense of security through feeding irradiated food stuffs. As an instance of this certain flours or cereals may be very efficiently irradiated and legitimately sold as irradiated food products, yet it will take several pounds of these irradiated food stuffs to produce the same

antirachitic effect as two or three teaspoonfuls of cod liver oil.

With our present knowledge the use of irradiated ergosterol and irradiated food products must be approached with an open mind. We have just stated that some irradiated food stuffs produce very little antirachitic effect yet it is possible these foods may produce beneficial effects of which we now know nothing. We are just beginning to realize the importance of the various vitamins on the different phases of the body metabolism, and when we use ergosterol in place of cod liver oil we should remember that although we are giving a substance with a marked antirachitic effect we are not giving the various other vitamins contained in large quantities in cod liver oil.

CONCLUSIONS

Rickets can be eliminated in the Province of Ontario by the following means, which antirachitic measures should be instituted with infants as young as 3 to 4 weeks of age.

1. Exposure of infants to sunshine and skyshine. In the winter and spring months it is possible to expose only the face and hands, but in the summer months practically the whole body should be exposed.

2. The daily administration of three to four teaspoonfuls of a biologically tested cod liver oil. (Tested for vitamin D content). This is most important during the winter and spring months when it is frequently impossible to expose the infants outside for any length of time. It may be omitted during the heat of the summer when the infant is being exposed to sunshine and skyshine.

3. The use of special ultra-violet transmitting glasses. These glasses are of undoubted value under controlled conditions during the late winter and spring months when the antirachitic effect of sunshine and skyshine is very great and

yet it is impossible to expose patients outside on account of the inclement weather. It is possible that in the late fall and early winter months, when the antirachitic effect of sunshine and skyshine is very low, an antirachitic effect of value may still be produced if sufficient of the infant's body is exposed to rays through these glasses.

4. The daily administration of activated ergosterol. Suitable doses of this substance dissolved in vegetable oil will soon be available to the medical profession. The pure substance has a simply tremendous antirachitic effect, but if given in large doses (50,000 to 100,000 times the minimal dose) it produces harmful effects.

5. The use of irradiated food. The medical profession is cautioned that the antirachitic effect of some of these irradiated foods may be very slight, and before relying on them as a means for the prevention of rickets an authoritative statement should be obtained as to their actual antirachitic value.

6. The use of the mercury quartz and carbon arc lamp. These lamps should be regarded simply as useful adjuncts to the other methods at our disposal. With certain severe cases of rickets which respond slowly to other methods of treatment these lamps are most valuable.

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There are many Egyptian days on which by no means or for any necessity is it allowable to let blood from man or beast, or to administer a (medicinal) potion. But of these days three are to be specially observed, namely, the eighth day of the Ides of April (April 6th), the first Monday in August, and the last Monday of December. This is to be carefully borne in mind, because all the veins are then full. But if on these days an incision be made into man or beast,

(the patient) shall die immediately, either on the same day, or on the third day, or (at least) shall not survive to the seventh day, and whoever shall take a potion shall die on the fifteenth day; and anyone, male or female, born on those days, shall die an evil death, and whosoever on these days eats flesh of goose shall die on the fifteenth day. The "venerable" Bede. *De Minutione Sanguinis sive de Phlebotomia.*

NERVE LESIONS IN CIVIL PRACTICE*

BY ALEXANDER GIBSON, F.R.C.S. (ENG.),

Winnipeg

BEFORE the war, lesions of the peripheral nerves were regarded as rather uncommon incidents; their diagnosis was somewhat obscure; and the treatment, if it were attempted, was based upon the principles of tendon repair. Military experience changed the outlook. The problem of damaged nerves had to be faced time and time again. It was seen that nerve lesions were for the most part easily diagnosed, most of them indeed by a fleeting glance at an injured limb, by the gait of the patient, or by the attitude of his fingers.

It was soon seen, too, that the repair of nerves bore no resemblance at all to the repair of tendons. It was not enough to secure anatomical continuity. The bulbs marking the ends of a severed nerve were worse than useless, no matter how definite the evidence of nerve fibres in them. A regenerating nerve fibre will not jump a gap. The provision of an ensheathing protective medium, such as blood-vessel, fascia, decalcified chicken bone, or Cargile membrane, was the surest way to make failure certain.

The material used for suture was not unimportant. Various substances were tried. Catgut was definitely unsuitable; the damage done to the nerve in passing the suture was excessive, and the area of penetration became a liquefied core. Silk was found to provoke the least fibrous reaction. Tension sutures passing through the whole thickness of the nerve were used, only to be discarded in the light of experience. The slightest degree of tension would vitiate the result.

A successful tendon repair may give complete recovery; a nerve suture is almost never wholly a success. A gap in a tendon may be overcome by the use of grafts. A nerve gap can never be bridged in this way.

The net result of military experience was to bring clearly before us nerve lesions which had hitherto frequently eluded observation and to

standardise to some extent our outlook and our treatment. This may be summarised in a few sentences. A certain proportion of our cases will obtain under favourable circumstances of repair a certain degree of recovery. In any individual case it is not possible to predict the amount or the speed of recovery.

As regards the operation of suture, it may be said that if it is possible to approximate the freshened ends exactly, without tension, one has a reasonable right to look for some degree of recovery. If there is tension or pressure, recovery is not to be expected.

A review of cases seen in private practice, from December, 1926, to April, 1929, *i.e.*, twenty-eight months, disclosed no fewer than seventy-three nerve lesions in sixty-nine patients. This excludes lesions of the brain, spinal cord, or sympathetic system, but includes peripheral nerves, both cranial and spinal.

ANALYTICAL TABLE

<i>Upper Limb</i>		<i>Cases</i>
Musculo-spiral	4	
Ulnar	22	
Brachial plexus	13	
Median	9	
Radial	3	
Lateral cutaneous of arm.....	1	
	—	
	52	
	—	
<i>Lower Limb</i>		<i>Cases</i>
Sciatic	1	
Tibial	1	
Peroneal	4	
Long saphenous	1	
Short saphenous	1	
Medial plantar	1	
	—	
	9	
	—	
<i>Cranial</i>		<i>Cases</i>
Trigeminal	4	
Accessory	1	
Facial	5	
	—	
	10	
	—	
Amputation bulbs	2	

One patient had a triple lesion.

* Read before the Sixtieth Annual Meeting of the Canadian Medical Association, Montreal, June 19, 1929.

L. was engaged in blasting operations, and was making his exit from a tunnel when a charge exploded killing his mate and disabling him. Some twenty-eight pounds of rock were removed from his body (patient's history). When he came under my observation he had a septic knee joint, a complete lesion of both peroneal nerves, a complete lesion of the left ulnar nerve, and was still carrying about a fair quantity of rock.

One patient had a double lesion.

G. fell from a telephone pole, sustaining a crushing fracture of the left calcaneus, with a lesion of the posterior tibial nerve, and a forward dislocation of the semilunar bone, causing pressure on the median with pain on movement of the wrist.

One patient had a bilateral lesion of the brachial plexus.

D. was driving his truck over a mud road. It skidded, overturned, and pinned him underneath it in the ditch. There was weakness in the muscles supplied by the brachial plexus on the right side, particularly those depending on the median nerve. On the left side the weakness of the brachial plexus was still more marked, the hand showing the typical claw deformity. Two months later the right side had recovered completely. The ulnar paralysis and loss of sensation did not clear up on the left side until six months later. A special splint was made to control the ulnar nerve deformity of the fingers and proved in this case very efficient.

It will be observed that 52 of the 73 occurred in the upper limb, while only 9 were lower limb conditions. There are several reasons for this. (1) Many of the lesions observed were industrial cases, in whom the hands were more subject to accident than the feet. (2) The mobility of the upper limb and its segments permits overstretching and damage to soft parts, the bones and joints escaping the brunt of the strain, whereas in the less mobile lower limbs, violence is more likely to bring about fracture, while the soft parts escape.

The types of pathological lesion may be grouped under the following headings:—

	Cases
1. Congenital	1
2. Tumour	1
3. Ischæmia	2
4. Contusion	12
5. Stretching	15
6. Laceration	25
7. Scarring	17
	—
	73
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Brief notes of some of the cases follow.

Congenital.—The patient, aged 13, was a deaf mute with facial paralysis. In this case the operation of hypoglossal-facial anastomosis was performed without much improvement. This

is the only failure in a series of some twelve such anastomoses. Is it possible that the hypoglossal nucleus is also under-developed, owing to lack of use of the tongue for speech? Or is the facial musculature represented only by fibrous tissue?

Tumour.—This patient had a tumour removed from the right axillary region, the operation being followed immediately by drop-wrist. When seen, she had a complete musculo-spiral paralysis. Exploration high up in the axilla enabled the ends to be brought together, a mass of indefinite tissue being excised from between the severed ends. The report on this tissue was that it was a neurofibroma.

Ischæmia.—Both cases were typical forearm fractures, treated by too tight splinting. The nerve lesions were only part of the picture.

Contusion	Cases
Musculo-spiral	2
Ulnar	5
Median	1
Brachial plexus	1
Facial	2
Short saphenous	1
	—
	12
	==

Stretching	Cases
Musculo-spiral	1
Brachial plexus	11
Median	3
	—
	15
	==

Apart from direct stabs, it is practically always a violent separation of head and shoulder that produces a lesion of the brachial plexus. The process of birth may produce this lesion. Otherwise, a fall on the shoulder is the most common cause. Otherwise, a fall on the shoulder is the most common cause. In one case a widespread brachial paralysis followed either a dislocation of the shoulder joint or prolonged efforts to reduce it.

A word may be said here regarding cases of musculo-spiral paralysis following fracture of the humerus. Any of the three main nerves in the arm, median, ulnar, or musculo-spiral, may be injured or torn. Sometimes there is a persistent musculo-spiral paralysis in which the nerve is not torn but is stretched over a projecting piece of bone as over a pulley. An arbitrary period of three months is usually allowed for spontaneous recovery. It is usually stated that musculo-spiral paralysis is apt to

occur from involvement of the nerve in the callus of repair. This is probably doubtful. One has found a nerve lodged in a groove in a bony callus, or embedded in fibrous tissue and degenerated muscle between the ends of an un-united fracture, but never a healthy nerve caught and pressed upon by bony callus.

Laceration	Cases
Ulnar	12
Median	5
Peroneal	4
Lateral cutaneous of arm.....	1
Facial	2
Accessory	1
	—
	25
	≈

In some of these cases the nerve may be one of several structures lacerated, say by a circular saw or a steel ribbon.

In the neighbourhood of the wrist there may be several tendons cut. A golden rule in such cases is to enlarge the wound well up the forearm. This will avoid missing altogether the fact that more tendons are cut than physical examination discloses; it may also avoid the risk of joining a nerve to a tendon.

One interesting case was that of A. T., a prospector lost in the bush. After many days of starvation, and torment from mosquitoes, he decided to end his life by severing the vessels at the wrist. Success attended his efforts to the extent of five tendons, the ulnar vessels and the ulnar nerve. He was rescued by a plane, operated on, and when last heard of was doing well.

A fragment of glass has an unpleasant way of penetrating the skin, sometimes to a considerable depth, severing a nerve such as the ulnar or the median, and then being withdrawn through a tiny skin wound. This is the type of accident which practically always calls for enlargement of the wound and careful exploration. Several cases of this character have resulted from street car accidents, where owing to the car lurching, the patient's hand has gone through a window.

Another cause of tearing of the nerve is the sharp edge of a fractured bone.

A nerve may be severed in the course of a surgical operation, such as the removal of enlarged glands from the posterior triangle of the neck, (accessory), opening up of the humerus for osteomyelitis of the shaft (musculo-spiral), or in the course of the operation for infected mastoid (facial). Another accident, which I have seen, though not in-

cluded in the present series, is section of the dorsal interosseous nerve of the forearm as it winds through the fibres of the supinator muscle.

Scarring.—In connection with nerve injuries the word "scarring" must be interpreted very widely. It includes everything from involvement of nerve fibres in a clean aseptic scar to the tender adherent bulbs in a septic amputation stump. The one characteristic common to all cases is the presence of fibrous tissue in intimate association with the nerve.

The simplest form of this is found where an operative wound cuts across a cutaneous nerve of moderate size. Such a case is the following:

Mrs. R., æt 60, came complaining of pain over the lower end of the radius and the adjacent styloid process. The condition was diagnosed as thickening of the sheath of the abductor pollicis longus, and extensor brevis pollicis. On exploration the sheath was found to be thickened and was incised longitudinally. The pain disappeared, except for a single tender spot at the extreme upper end of the scar. Investigation showed that the incision had nicked the superficial branch of the radial nerve as it wound around the radial border of the radius about two inches proximal to the styloid process.

The condition mentioned has latterly been described as "stenosing teno-vaginitis"; so it may not be amiss to point out this little neural pit-fall. On all fours with this condition is one which may be met with as a complication of the operation for exploration of the internal semilunar cartilage of the knee. The patellar branch of the long saphenous nerve may be nicked or cut in the incision, and give rise to an area of anæsthesia and a tender point on the scar which persist long after the original condition has been recovered from. In neither case is there any excuse if one keeps in mind the presence of the cutaneous branch referred to.

Rather more common than this type of case is that where the nerve is caught in a terminal scar. This is particularly frequent after operations for amputation of fingers or toes. There is always a praiseworthy disposition to save every millimetre of tissue, and the consequence is that these amputations are often the seat of points of tenderness. They are generally readily dealt with by finding and resecting the adherent digital nerve.

Precisely analogous to these was the case of G., who sustained a lacerated wound of the left arm below the deltoid insertion. This was treated successfully by a Thiersch graft about four inches by three inches. On it there were several tender spots, and after use of the arm

at work aching was complained of as high as the shoulder. Exploration showed the terminations of three large cutaneous nerves in the scar, the lateral cutaneous and the two dorsal cutaneous nerves of the forearm from the musculo-cutaneous and musculo-spiral nerves respectively. Resection of these produced freedom from pain.

It will be noticed for the most part that pain is the outstanding feature of compression of nerves by fibrous tissue. There is likely to be loss of motor activity, but pain of variable intensity is practically always present. A specialized example of this is found in the case of the ulnar, in the condition known as "late ulnar paralysis" of which there are two examples in this series. "Late ulnar paralysis" is always the end result of a fracture of the lateral epicondyle of the forearm, generally sustained in childhood. Ten, fifteen, twenty, thirty or forty years afterwards, the ulnar nerve shows the sequel. Typical is the case of:

L. L., aged 40. This patient came complaining of weakness in the muscles of the right hand. He had been a barber for some sixteen years and recently had found himself unable to do a full day's work without the hand tiring excessively. During the last two years there has been wasting of the interossei. At the age of five he had an injury to the right elbow.

On examination sensation was lost over the typical ulnar area. There was marked wasting of the interossei, notably the first, and to some extent also of the hypothenar eminence. Examination showed an old fracture of the external condyle of the humerus, and this was confirmed by x-ray.

At operation, the ulnar nerve was found to be compressed by a thickened adherent sheath. This was dissected off, and the nerve fibres isolated from one another. The nerve was subsequently transplanted to the front of the elbow joint. Discomfort ceased at once. He returned to his work two weeks after operation, and when seen two months later, was able to do a full day's work without any sensation of tiredness. There was slight return of sensation in the ulnar area.

The most striking case of nerve compression from fibrosis as the result of injury that I have met with is the following:

Mrs. D., aet 46, housewife. She was seen for the first time on April 2, 1928. On December 11, 1923, a window fell on the forearm and broke it. The arm was "set" in the country. She then came to Winnipeg and had baking and massage for six weeks. The arm was still painful and was opened up on March 11, 1924. Since the operation the hand has been worse than useless. The wrist became flexed and the fingers flexed into the palm. Plasters to overcome the flexion were applied on seven or eight occasions.

On October 11, 1924, another operation was performed and a piece of the nerve was removed. In June, 1925, advice was sought elsewhere, but nothing further was done. The condition became steadily more painful and the patient came considering the advisability of amputation.

On examination, the patient kept the left hand closely to the side. It was strongly palmar flexed. The skin of the hand had not been washed. It was scaly and excessively tender. The fingers and thumb were

strongly flexed. The thumb and forefinger showed changes in the ungual region characteristic of nerve loss.

The report of the surgeon who explored the nerve on March 11, 1924, was as follows: "The condition of the median nerve was explored from the flexor crease at the wrist downward for an inch and upward for two inches. Its appearance was entirely normal."

On July 13, 1928, the median nerve was explored. The sheath was found firmly adherent to the nerve and the individual fibres were firmly bound to one another. About an hour was spent freeing the sheath from the nerve and separating the individual fibres from one another until the median nerve presented the appearance of a flat leash of fine fibres instead of a rounded cord.

On July 23rd the stitches were removed without pain. All dressings were discarded on July 26th. The patient was seen for the last time on March 14, 1929. There was no pain in the hand or in the fingers. There was loss of sensation in the thumb and index finger, the result of the resection of October 11, 1924. The flexor carpi radialis showed contracture, but patient was content to keep the hand as it was.

This brings up the question of dealing with nerves the subject of compression. It is not enough to inspect the nerve. Incise the sheath. In the normal nerve the sheath can be pushed from the nerve by a blunt instrument. If sharp dissection is necessary the sheath is adherent and the condition is likely to be painful. Separation of the individual fibres is a long and tedious process. The word "harsage" has been used to describe the operation. The results are as a rule very gratifying. The term neurolysis denotes rather the separation of a nerve as a nerve cord from a sheath of adventitious fibrous tissue.

An interesting example of fibrosis of a nerve is sometimes met with on the medial side of the heel. There is tenderness in the area of distribution of the medial calcaneal nerves. This tenderness is sometimes associated with thickening of the posterior tibial nerve just behind and below the medial malleolus. This condition may be a sequel to a crushing fracture of the calcaneus. In other cases there may be no history of accident. Some of these patients have the habit of kicking the inner side of the ankle with the heel of the opposite shoe, and this, long-continued, may lead to scarring of the posterior tibial nerve.

Cranial Nerve Lesions.—Four patients presented lesions of the trigeminal nerve. Of these one was a typical tic douloureux, and the usual excellent result was obtained by resection of the sensory root.

A second patient suffered from pain in the trigeminal distribution, following an attack of herpes facialis. This was accompanied by re-

curring crops of vesicles, which left behind them small scars involving the whole thickness of the skin.

Two other patients had neuralgia confined to the mandibular division of the trigeminal nerve. This was treated rather simply by resection of the inferior dental nerve, and through the same incision, the buccinator nerve. A small incision inside the mouth allowed resection of the lingual nerve. In both cases the pain was completely abolished.

Facial.—Of the six cases of facial paralysis, one was congenital and two followed fracture of the skull. Of the other three cases one followed the opening of a parotid abscess, and the others were consequent on a radical mastoid operation. Three cases had a hypo-glosso-facial anastomosis performed.

The treatment of permanent facial paralysis is not standardised. Some join the spinal accessory to the facial stump. Recently a plea has been made for the use of the glosso-pharyngeal, in order to avoid associated movements of the tongue or shoulder. In my own cases, these associated movements have not been observed. With one exception all the cases operated on have regained muscular tone and voluntary movement in the paralysed muscles. None have obtained an emotional response, although recovery including this has been reported by other surgeons. The loss of half the tongue musculature has never proved a serious disadvantage. One patient, a minister, preached a sermon to his congregation ten days after his operation.

The Accessory.—In one case the spinal accessory nerve was severed in the course of removal of tuberculous glands in the posterior triangle of the neck. It was possible to identify and unite the severed ends.

MEDICAL TREATMENT

Conservative treatment consists essentially in the lapse of time. Massage and electric stimulation are of little importance. After watching the effect of galvanism and faradism in several hundred cases of nerve lesion, I doubt if its value be not almost entirely psychic. No amount of electric stimulation will bring back nerve function if the anatomical interruption be not overcome, and if the anatomical interruption be adequately overcome, electricity

is probably not necessary. Massage is of value if it be done correctly. I prefer to use the term "skin-stroking" rather than massage. That is often better carried out by the patient's relatives than by the professional rubber, who does not always envisage the difference between a muscle deprived of its nerve supply and one the seat of fibrositis.

It is not always possible to tell when a nerve is severed and when it is merely contused. This uncertainty is most probable in cases of fractured humerus. As a working measure, the space of three months is devoted to conservative measures—splinting and massage. If at the end of this time there is no definite return of function, exploration should be undertaken.

OPERATIVE TREATMENT

The following operations were performed.

	Cases
1. Freeing from bony pressure...	4
2. Neurolysis and "hersage"....	8
3. Resection	8
4. End to end suture.....	12
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	32
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Several types of operation were performed. The simplest was that of freeing the nerve from bony pressure. Of this there were three cases: musculo-spiral, one; median, one; posterior tibial, one.

Resection was performed for adherent bulbs in amputation stump (2) and for adherent terminal scars. It was also employed in three of the trigeminal cases.

Neurolysis and "hersage" were employed in eight cases. Of these two were examples of "late ulnar paralysis" and included transplantation of the nerve to the front of the elbow as well as freeing it from fibrous tissue.

The most exacting operation technically is that of end-to-end suture. Twelve of these were performed, with some degree of improvement in most that were done six months ago or more, with complete recovery in none. It is not generally realized that recovery of sensation may be as important as recovery of muscular power. In one patient who had the ulnar nerve sutured across a considerable gap and in whom the recovery of sensation was negligible, amputation of the two distal phalanges of the ring and little fingers had to

be performed for persistent ulceration. This patient worked in the north country, often far from medical aid, and he found the stumps more useful than longer digits liable to break down and become infected under severe winter conditions.

The technique of end-to-end suture is a delicate one. There are many details that cannot be described on this occasion. The finest ophthalmic needles and the finest silk are none too fine for the work.

The surgery of peripheral nerves has no attraction for the impatient. Results are always slow in coming and are often incomplete. Disappointments are frequent, and hopes are often raised in the first few weeks which fail to materialize as the months go by. There are few dramatic moments such as come from, let us say, removal of pressure upon the motor cortex, and yet in the majority of nerve lesions we meet

something can be done to improve the patient's condition. It may be that exploration shows an unbridgeable gap; then we know at least that the injury is permanent, and can seek by tendon transplantation or otherwise to minimise the disability.

In the large group of cases where pain is the outstanding feature, we can do a good deal, much more indeed than is generally realized, to make the patient's condition more tolerable. R. L. Stevenson has said,

To travel hopefully is a better thing than to arrive.

It is questionable how far the practical-minded surgeon is entitled to apply this maxim to his handiwork. In the domain of the peripheral nerves he may reach a destination not far removed from his starting point, but it is better at least to have travelled hopefully than not to have travelled at all.

METHODS AND RESULTS IN PERIMETRY*

BY LUTHER C. PETER, M.D.,

Philadelphia, Pa.,

THE adoption of proper methods in the practice of perimetry is quite as important as is finished technique in surgery. In either instance a well thought-out system is apt to yield the best results. In surgery, each case becomes an individual problem, in which the technique must be varied to meet the requirements. Perimetry differs, however, in this respect. If the case is not of a definite character and so diagnosed, a preliminary study must be made in order to determine which part of the field will require searching analysis to accurately determine the extent of the defect. For this purpose, a routine instrument is advantageous. The essentials which should be embodied in such an instrument are: first, simplicity; second, ease of application; and third, a fair degree of accuracy.

The hand campimeter, in my experience, fulfils these requirements. It was offered to the profession for exactly this purpose, and no

further claims were made for it, although in the hands of one who has mastered its technique it has far greater value. In the use of any routine instrument, time is an important factor, and simplicity in application helps to save time. As a routine instrument, the tangent screen of short radius serves a two-fold purpose. It first calls our attention to the part of the field in which disease exists; and, in the second place, if the technique is properly followed, in a large proportion of cases it accurately outlines or determines all the field disturbance which can be uncovered by special technique.

SPECIALIZED PERIMETRY

Having determined the part of the field which may require more searching study, the special instruments available for such study are the following: (1) for central field studies; (a) the Ferree-Rand slate, (b) the Lloyd slate, (c) tangent screens of long radii, (d) stereo-campimeters; (2) for peripheral field studies, standard perimeters.

The Ferree-Rand slate.—I stated above that

* Presented in amplified form before the Ophthalmological Section of the Toronto Academy of Medicine, on March 11, 1929.

in the hands of one who has mastered the technique of the hand campimeter, it will uncover any defect, whether central or peripheral. If the defect is in the peripheral field, determined by a very small test object, it would be inadvisable to fail to study such defect by means of the instrument specially designed for and capable of faithfully outlining a peripheral defect, namely, a properly standardized perimeter. In the central field, one may wish to make further study of a central defect. Although all the standard instruments in this group will be discussed, in my experience the Ferree-Rand slate is the most valuable and accurate, and I have found it to be applicable to the correct study of any central defect which I have encountered in my clinical work. Its greater accuracy and superiority, as compared with tangent screens of long radii, will be discussed at the proper time. For the present, I wish to call attention to its value as standard in all respects in which standards can be applied, in illumination, fixation, minute test objects, and in pre-exposure and surrounding field, if the latter is desired. The scotomas of toxic amblyopia and amblyopia *ex anopsia* require the most refined technique to outline their borders. They are easily and definitely outlined on the Ferree-Rand slate. A luminous point of light serves as a fixation point. Added to this is the probable development of Cowan's new mirror device which admits of binocular stereoscopic fixation with exclusion, at the same time, of the fixing eye from the central field. This latter method, when perfected, promises new developments in the outlining of a central scotoma.

We are not concerned at this time with minutiae of detail in the rapid presentation of methods. A few facts, however, should be definitely stated in order to make our presentation comprehensive. They are:—

First, any satisfactory method of study should have standard and uniform illumination. To state the degree dogmatically, at the average distance employed, 7 foot candle power artificial daylight is now regarded as standard.

Second, fixation should be as perfect as possible. To obtain this, and in order to train the patient to concentrate on the point of fixation, it is always best to begin the study by outlining the blind spot of Mariotte. When one fails to

make this an initial study, he is often chagrined to find, at the end of a prolonged study, that his work is valueless because the patient was not trained to maintain perfect central fixation.

Third, the size of the test object should be standard. By this is meant the test object for form should be the smallest stimulus that an individual patient can see within the 20° circle. In an average case, this should not exceed 30 minutes, and in many cases, it will be as small as 10 minutes. Coloured test objects, at an average range of 333 mm., should subtend an angle of 1° and at shorter range should not be less than 30 minutes. Any smaller coloured test object is apt to give rise to error and inaccuracy.

Fourth, in the use of coloured stimuli, which is part of standard technique, pre-exposure and surrounding field should receive due consideration when minute depressions in the peripheral field are under investigation.

These four requisites should be regarded as standard, and any method which does not include them can hardly be regarded as standard and worthy of serious consideration.

The Lloyd slate.—This is an instrument of much value in carefully selected cases. Because of its mechanical limitations, it can only be regarded as a specialized tangent screen. Stereoscopic fixation is its great feature. It is especially adapted to a study of the blind spot of Mariotte, central glaucomatic scotomata and any unilateral central field defect, if the muscle balance is practically normal. If this slate were marked as are other instruments, its value would be much enhanced. It is an important unit of a complete perimetric equipment, although not strictly essential.

Tangent screens of long radii.—The profession is divided as to the intrinsic value of screens which are operated at a radius of one and two metres. Many still believe that they furnish the only accurate means of outlining a small scotoma. My first studies in perimetry were made with this type of screen, and I naturally was impressed with the value of the method. I devised several for my personal use in which the average normal blind spot was carefully outlined. The difficulty in obtaining standard illumination and accurate fixation soon led me to more refined methods of study. Their impracticability in an average office is a third objection to their use. Finally, the addition to

SUMMARY

A late analysis of the data concerning the Manitoba poliomyelitis epidemic of 1928 shows that of 272 cases, concerning whose present or recent condition it has been possible to obtain reasonably accurate data, 143 have completely recovered, and 128 still show some degree of paresis or paralysis (one other in the latter group died of pneumonia).

The total number of deaths attributable to the epidemic is 40. No present information is available concerning 123 cases. Since for most of these cases the Committee's circular was not returned by the postal authorities (indicating that it had been properly delivered) nor by the

parents, it is not improbable that the majority of them completely recovered.

Careful analysis of the group previously specially investigated to ascertain the effect of convalescent serum treatment yields data confirming the conclusions previously drawn, that this treatment seems beneficial when given in the pre-paralytic stage.

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INTRATRACHEAL ETHYLENE-OXYGEN ANÆSTHESIA*

BY HAROLD R. GRIFFITH, M.D.,

Montreal

AT the Montreal convention of the Eastern and Canadian Societies of Anæsthetists in 1926, Dr. McMechan gave a report on intratracheal nitrous oxide-oxygen anæsthesia as practised by Magill and others in England. This work appealed especially to us in Montreal, since for several years intratracheal ether anæsthesia had been our routine procedure in adult nose and throat cases. So Stewart¹ at the Montreal General Hospital began intratracheal nitrous oxide in a few selected cases, and since then he, Hargrave,² and others^{3 & 4} have continued and developed this method.

For four years at the Homoeopathic Hospital of Montreal I have been using ethylene, and I have grown to appreciate its value. Therefore after a few intratracheal nitrous oxide administrations, I felt I could safely substitute ethylene with its unquestioned advantages. We have thus evolved a technique for intratracheal ethylene-oxygen anæsthesia which has proved most satisfactory in a comprehensive series of cases, and which I feel has enabled us to anæsthetize certain patients with a new degree of safety and comfort.

We have used intratracheal ethylene successfully in the following types of cases:

1. Tonsillectomies in both adults and children, when ether was for some reason contra-indicated, or when the patient was anxious to avoid the discomforts of ether anæsthesia. In some cases the operation lasted for more than an hour, with the patient satisfactorily relaxed.

2. Mastoidectomies. We had a series of cases last winter in small and very frail children following an epidemic of measles in an orphans' home. Gas seemed the anæsthetic of choice, and intratracheal ethylene enabled us to bring these children through long operations with a minimum of danger. Respiration is delightfully under control, there is no choking with mucus, and the anæsthetist is well out of the surgeon's way. At the other extremity of age, we recently operated on a man of seventy with an acute and extensive mastoid infection. He was an alcoholic with myocardial degeneration, and came to the operating room with no preliminary morphine. I regarded him as an extremely poor prospect for anæsthesia. However I was able to keep him perfectly relaxed for over two hours with intratracheal ethylene, and no more ether than a few breaths during the induction. He left the operating room wide awake, and has made an astonishingly rapid recovery.

3. A series of septum, antrum, and other sinus, eye, face, and brain operations. Our surgeons usually prefer to do their septa under

* Read before the joint meeting of the Eastern and Canadian Societies of Anæsthetists, Boston, October 9, 1928.

local anæsthesia, but in cases where the patient has insisted on being put to sleep, they have told me that there is much less congestion of the mucous membranes with intratracheal gas than with ordinary ether anæsthesia.

4. *Thyroidectomies.* Intratracheal anæsthesia is here favoured by our surgeons because of the impossibility of tracheal collapse, and because the firm catheter forms an excellent landmark in the larynx and the trachea. My experience has been that ethylene is more satisfactory in these cases than nitrous oxide, and with it I have had a patient well relaxed and in good condition for as long as three hours, without once resorting to ether.

TECHNIQUE OF ADMINISTRATION

The patients are usually prepared with morphine $\frac{1}{4}$ grain and hyoscine 1/150 grain one hour before operation, and another hypodermic of morphine 1/6 grain half an hour later, but in this I follow no set formula, and many of our cases, especially children, have had no preliminary hypnotic medication.

Anæsthesia is induced in the usual way with nitrous oxide oxygen, using a little carbon dioxide if necessary. Then I switch to ethylene for more complete relaxation, occasionally adding a few breaths of ether. The head is thrown back into position for intubation, then the face mask is removed and the larynx exposed as quickly as possible with a Jackson speculum of suitable size. This is really the only part of the technique which requires any particular dexterity; and skill comes only with experience. I would not advise an anæsthetist to attempt this procedure under gas until he has become accustomed to using the direct laryngeal speculum with the patient more completely relaxed under ether. Great care must be taken not to damage the posterior wall of the pharynx, and the upper incisor teeth may be broken if leverage is used instead of the proper lifting movement. If the larynx is not successfully exposed at once, it is unwise to struggle with the patient half awake, but one should return to the face mask, and try once more as soon as the patient is again relaxed.

Then when the larynx is in view, a silk or lisle catheter of the proper size is introduced, and the end pushed down to about three centimetres above the bifurcation of the bronchi. In the average adult this will be about 22 centimetres

from the teeth. In the meantime an assistant has turned a two-way valve on the gas machine, which directs the gas into a small nasal bag to which is attached an ordinary irrigator nozzle. This is at once inserted into the end of the catheter projecting from the mouth, and the anæsthesia continues. A mouth-gag is adjusted to prevent any possibility of the patient biting the intratracheal tube, the speculum is then removed, and the patient is put in position for the operation.

The catheter is of such a size that it will nearly fill the trachea. I use all sizes from F16 or F18, for infants, up to F32, which is the largest size I have been able to obtain. Stewart uses an ordinary rubber rectal tube. It is very important that the catheter be large enough to prevent inhalation around it of much air. On the other hand, a catheter that is too large may irritate the larynx, especially in children.

The patient should do a good deal of rebreathing into the small rubber bag to which the catheter is attached. I usually keep my hand on this bag, and thus even when the patient is completely covered, I can follow the depth and rate of respiration and can control the intrathoracic pressure. The bag may be greatly distended before the pressure becomes dangerously high, giving one plenty of warning to reduce the flow of gases. But as an extra precaution I have a mercury manometer on the machine, set to blow off at twenty millimetres. I feel that the use of this small rubber bag is a very great advantage in this method of anæsthesia.

During such an anæsthesia the patient's respiration is always under control, with no possibility of obstruction. One can obtain an almost immediate response to carbon dioxide or oxygen stimulation when necessary. Relaxation with ethylene is more satisfactory than with nitrous oxide: the patient is awake immediately after the operation, and nausea seldom occurs. The method is extremely economical, since the consumption of ethylene during an average administration is from three and a half to four litres (or less than one gallon) a minute. With small children I often use as little as one and a half litres a minute.

I have kept in mind constantly the possibility of explosion with ethylene, but so far after four years and about twelve hundred administrations we have had no accident in our hospital. We

use the Foregger "Metric" and the "Safety" machines, both of which are of the type which contains water. In order that the gas may flow only over a wet surface, I introduce also a few drops of water into the rubber tubing and the rebreathing bag. I have never used any grounding device.

The experimental work of Hornor and Gardenier,⁵ and of Poe⁶ and others has demonstrated that we may maintain in the machine and bag an anæsthetic mixture of ethylene and oxygen which is entirely outside the range of explosibility. I start and finish my anæsthesia with nitrous oxide instead of ethylene, and the addition of carbon dioxide still further reduces the explosion hazard. On the other hand, the exhaled gas soon becomes so dilute in a well ventilated room that it will not explode, and I do not hesitate to run a properly shielded electric suction machine within a few feet of the patient. However, there must always be a certain region near the patient's face where the exhaled gas is just the right mixture for explosion, so we make it a rule never to allow the use of a cautery or other open flame or spark in the operating room during the administration of ethylene, and we never use this gas except under the carefully supervised technique of the operating or delivery rooms.

We have used intratracheal ethylene for patients of all ages between fourteen months and seventy years. It seems to me to be an almost ideal anæsthetic method for small children, provided one is careful not to damage the pharynx with the speculum, and a catheter of exactly the proper size is used. There is no hypersecretion of mucus as with ether, and the respiratory

effort is not laboured. The gases are delivered directly into the lungs under a gentle positive pressure, and so the dead space which might be present with ordinary mask administration is entirely abolished. I have never had any resulting pulmonary complications, even in cases with pre-operative respiratory infection. However, in one case of a child of eighteen months there was a sharp temporary laryngitis. This was due to the use of a catheter a little too large.

In conclusion, I would like to express my thanks to those surgeons who have given me the opportunity to develop this method, and especially to Dr. A. W. Furness, on whose otolaryngological service all our first cases were undertaken.

SUMMARY

1. Intratracheal ethylene-oxygen anæsthesia has been used successfully in a series of nose, throat and ear operations, and in thyroidec-tomies.
2. The technique of administration is described, and safety factors in the use of ethylene considered.
3. This method seems of special value in operations upon children.

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INTRACARDIAC BLOOD TRANSFUSION.—A. Tzanek reports a case in which a young woman on the verge of death from extreme hæmorrhage was saved by intracardiac blood transfusion. Following an abortion so much blood was lost that the patient became unconscious; she was covered with cold perspiration, the pulse disappeared, the pupils dilated, and one or two sighing respirations were obviously the forerunners of death. In this emergency 650 grams of unaltered blood were injected into the heart, there being no time to determine the necessary

type, nor could any vein be found. Quick restoration of colour followed and consciousness returned. The uterus was then plugged, but this caused a slight attack of faintness, which necessitated the further transfusion of 400 grams of blood intravenously, after verification of the blood group. The patient's subsequent convalescence was uneventful. The author recalls the case of this kind reported by Achard, Cournand, and Pichot. (See *Epitome*, March 30th, para. 320.)—*Epitome, Brit. M. J.* Aug. 10, 1929.

CONGENITAL TUBERCULOSIS*

REPORT OF A CASE

BY R. R. STRUTHERS, M.D., AND H. G. MITCHELL, M.D.,

Montreal

THE infrequency of intra-uterine tuberculous infection is well known. Since the first authentic human case of congenital tuberculous disease, which was reported in 1891 by Schmorl and Birch-Hirschfeld, several other cases have been recorded. In 1909 Klebs¹ recognized 25 authentic cases. By 1927, Baldwin, Petroff and Gardner² stated that about 60 cases in all were reported in the literature. These were all instances of maternal transmission by way of the placental blood. Scheer³ emphasized the fact that two different types of congenital tuberculosis have to be distinguished, namely, those with pathological changes in the hepatic porta, placental infection, and those with primary involvement of the respiratory tract, whether through placental infection or perhaps bronchogenous from inspiration of amniotic fluid.

Congenital tuberculosis constitutes, according to Scheer, 5 per cent of infant tuberculosis, being thus of more common occurrence than has hitherto been suspected. Infants with congenital tuberculosis are usually born before term and under weight. The prognosis is not altogether fatal.

Choremis⁴ reports the occurrence of tuberculosis apparently congenital and of intra-uterine origin in twin girls (foundlings). When received, the infants appeared normal and sufficiently well developed for their age (3 weeks). The tuberculin test, applied as a routine, was positive. The condition of the children deteriorated rapidly and they died after two weeks or less. The diagnosis in one case was generalized tuberculosis with particular localization in the lungs; in the other case, miliary tuberculosis of the lungs.

It is noted that in the second case the child

never had fever, and that at necropsy there were no signs of tuberculosis in the hepatic region; neither liver nor spleen was palpable. Tuberculides were absent in both cases. If they had been present, they disappeared before the children were brought to the institution.

De La Alberca⁵ reports three cases in which death at the age of one month, seven weeks, and five months, respectively, was explained by cheesy tuberculous mesenteric glands. No other tuberculous lesions were discovered at necropsy. He remarks that these congenital primary lesions might be found more often if systematically sought for.

Kochmann⁶ reports a case which was undoubtedly one of congenital tuberculosis. The infant had been isolated immediately after birth. She had a positive tuberculin reaction on the twenty-sixth day, and a roentgenologically manifest pulmonary focus in the sixteenth week. There were no other clinical signs, except a slight cough and twice a subfebrile temperature. At the date of the report she was 128 days old, had gained 1,600 gm. in weight and 10.5 cm. in length.

Debre and Lelong⁷ assert that thorough observation, necropsies, microscopic examinations, and inoculations seem to testify that no contamination with tubercle bacilli is possible by way of the placenta, nor is there inheritance of a tuberculous soil. The doctrine of the inheritance of tuberculosis, they say, is not based on facts but on impressions. They can find no evidence to sustain it.

Calmette and Valtis⁸ relate experiments, made in collaboration with Negre and Boquet, in which gravid guinea-pigs were inoculated with filtrates of tuberculous products or cultures. It appeared that the filtrates contained virulent elements able to attack the fetus after having passed through the intact placenta. The fetal lesions were localized almost exclusively in the subhepatic lymphatic glands. Characteristic

* From the Department of Pathology of the Montreal General Hospital.

Read at the Seventh Annual Meeting of The Canadian Society for the Study of Diseases of Children, May, 1929.

acid-resisting tubercle bacilli were found there. The thinning of the endothelial wall of the placenta at the end of gestation in these animals might favour penetration. This anatomical phenomenon may be less pronounced in the bovine and human species. However, it is probable that intra-uterine contamination of a calf or infant is not an exceptional occurrence. It probably proves rapidly fatal, without any well defined lesions in any organs.

According to Calmette, Valtis, Negre and Boquet,⁹ it was demonstrated experimentally that, following the inoculation of pregnant female animals with filtrates obtained by filtering tuberculous pathological products or cultures of tubercle bacilli through Chamberland filters, the fetus may be infected through the placenta. When the fetuses were killed after birth many were found to have pathological foci which contained true tubercle bacilli.

Kochmann¹⁰ states that a mother with open pulmonary and laryngeal tuberculosis bore an apparently healthy child, but the mother died eighteen days after delivery. The child was entirely removed from the mother after delivery. On the 26th day it exhibited a positive tuberculin reaction, and on the 106th day roentgenological pulmonary foci.

Bernard¹¹ is of the opinion that until further evidence to the contrary has been brought forward, a hereditary infection must still be regarded as playing a negligible part in the etiology of tuberculosis, and that contagion is responsible for tuberculosis in the infant—maternal contagion in the majority of cases; contagion through other people, with whom the infant comes in contact, in exceptional instances. In every case in which an infant born of a healthy mother has become tuberculous, a careful inquiry reveals a tuberculous contact.

According to Opie,¹² "Hereditary transmission of tuberculous infection from parent to child may be regarded as a negligible factor in the spread of the disease. Transmission from mother to fetus by way of the placenta has been described in a small number of well authenticated instances, and has occasionally caused fatal disseminated tuberculosis in early infancy; but this event occurs so seldom that congenital transmission of tuberculosis has been regarded as insignificant. Nevertheless, the

opinion that an ultramicroscopic form of the tubercle bacilli which can pass through a porcelain filter penetrates the placenta and infects the fetus in utero has been advocated by Calmette and other French observers. The existence of these filtrable forms of the micro-organism is still uncertain."

The following case report deals with a mother, admitted to the Montreal General Hospital, and her child:

Mrs. F. A. was admitted to the Montreal General Hospital on June 29, 1928, complaining of pain in the left chest posteriorly, sweats, and general malaise. Her illness began in April, 1928, when she suffered from what she considered an ordinary cold. From that time her condition became steadily worse.

On examination, she was seen to be a poorly nourished, fairly well developed, young woman, obviously quite ill. The skin was hot and dry. There was no general glandular enlargement. She had a dry non-productive cough, some dyspnoea, and a slight degree of orthopnoea. Movement of the left side of the chest was limited, and a dull note was obtained on percussion over the left side. The right side was clear to percussion. Grocco's sign was not present. The breath sounds were vesicular over the right side; on the left, broncho-vesicular anteriorly and in the axilla, and absent posteriorly below the fifth dorsal vertebrae. Pulse 104; blood pressure, 104/74. There was no increase of cardiac dullness.

She stated that she was eight months pregnant, and the physical signs corroborated this. On July 1st she went into labour and delivered herself of a small premature female infant. There was no instrumentation. The placenta followed in half an hour.

The mother had two chills the same day. The abdomen became distended with gas, and fluid was first noticed in the flanks. There were no more chills, but the pulmonary condition progressed, with increasing cyanosis and distress. By July 10th there was dullness over both lungs, with showers of crepitant râles in each axilla. The fluid in the peritoneal cavity increased. There was at no time any evidence of meningitis. The temperature was continuously elevated, with daily remissions from 102° F. to 100° F. X-ray on July 5th showed a marked diffuse fine tuberculous infiltration extending over both lung fields. (Fig 1). The clinical diagnosis, supported by the x-ray, was generalized pulmonary tuberculosis, although no sputum could be obtained to search for acid-fast bacilli. She died on July 14, 1928. Autopsy was not permitted.

The birth weight of the baby was 4 lbs. 9 oz. The infant was immediately removed from its mother and sent to the Royal Victoria-Montreal Maternity Hospital. It was put on artificial feedings, and, on account of its prematurity, about eight months, was placed in an incubator, but failed to gain in weight. On the thirty-sixth day of life the temperature rose to 100.4° F. and from then on was almost continuously elevated, usually between 99.4° F. and 100.4° F., but reaching 103° F., a few days before death. On August 13th, aged 42 days, when it weighed 4 lbs. 5 oz., it was transferred to the Montreal Foundling Hospital. Later, the child became dyspnoeic and cyanosed. The chest became dull throughout on percussion, with a flat note at the right base. On auscultation fine râles were heard all over the chest. Intradermal injections of old tuberculin in increasing strengths gave negative results. Cerebro-spinal fluid obtained by lumbar

puncture was normal. By September 8th there was evidence of a pneumonic process and an x-ray of the chest on September 10th showed miliary tuberculosis with a pneumonic patch at the right base (Fig. 2). The greatest weight (5 lbs. 15 oz.) was reached the same day (September 10th). The dyspnoea and cyanosis progressed, with advancing physical signs in the chest. The infant died on September 16th, aged 78 days. Autopsy was performed on the same day, twelve hours post mortem.



FIG. 1

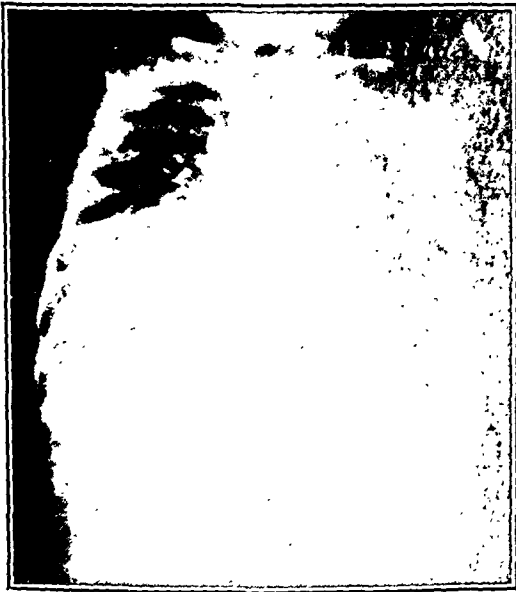


FIG. 2

AUTOPSY FINDINGS

The body was that of a very emaciated and poorly developed white female infant, 29 cm. in length. The buttocks were excoriated. The peritoneal cavity contained nothing of note. The pericardial sac was normal. There was a slightly excessive amount of clear fluid in the

pleural sacs. Both parietal and visceral pleurae were studded with small greyish tubercles. The lungs were voluminous, light pink in colour, and small firm nodules could be palpated in them. On section the cut surface of both lungs was uniformly involved in a diffuse patchy consolidation of greyish caseous areas, some of which were confluent, varying in size from 0.1 cm. to 1 cm. in diameter. The intervening lung tissue was somewhat oedematous and congested, and a small amount of mucopurulent secretion could be expressed from the smaller bronchioles. The mediastinal lymph-nodes and bronchial nodes were enlarged, some to 1 cm. in diameter, very firm, and on section were yellowish grey and caseous. The heart was apparently normal. The liver was somewhat enlarged, but presented no gross lesion, externally or on section. The spleen was slightly enlarged but presented no gross pathological findings. The kidneys and remaining organs showed no gross lesion. The mesenteric lymph-nodes were not enlarged nor caseous. There was no lesion of the gastro-intestinal tract.

The lungs, microscopically, showed a very extensive tuberculous process, the lesions falling into three general stages, consisting of:

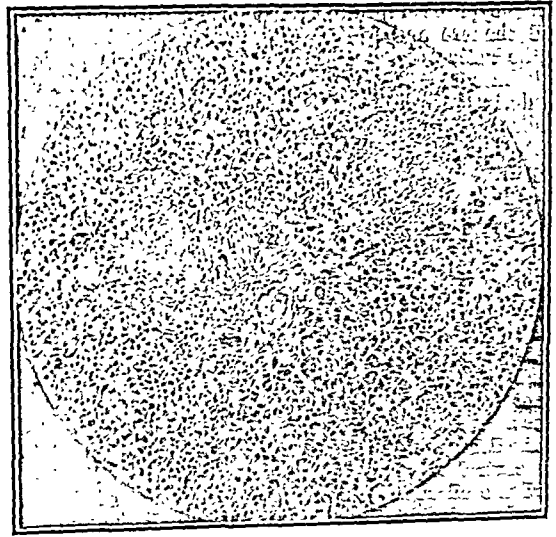


FIG. 3.—Liver showing the oldest tuberculous lesions.

(a) Areas in which the alveoli were filled with catarrhal alveolar cells, small lymphocytes, and endothelioid cells. Tubercle bacilli were extremely numerous. These represented the most recent lesions. (b) Areas where these lesions had coalesced. The central portion had lost its cellular differentiation and staining

characteristics and had become caseous; occasional giant cells were seen. (c) Older lesions showing in addition to the above, reparative changes in the nature of fibrosis. Differential stains showed fibroblastic reaction and the formation of fibrous connective-tissue. The liver was also diffusely invaded by a tuberculous process, consisting of microscopic tubercles. As in the lung, these were of different stages. Some were very recent, while some showed more advanced fibrosis than that found in any other organ (Fig. 3). The spleen showed many microscopic tubercles, but was less generally involved than the liver. The mediastinal glands were the seat of a tuberculous lymphadenitis. Special stains revealed the presence of acid-fast bacilli in large numbers in the tissues of the lung, liver, spleen, and mediastinal glands. The kidneys, heart, thymus, pancreas and adrenals showed nothing remarkable.

Although the placenta was not examined in this case, we feel that the very widespread infection, the estimated age of the lesions, the

oldest one being in the liver, the fatal termination of the disease at such an early age, the fact that the child was not even seen by its mother, and the immediate and continuous isolation from probable sources of infection, are sufficient evidence to warrant a diagnosis of ante-natal tuberculous infection.

This case was admitted to the Montreal General Hospital to the service of Dr. D. Grant Campbell, to whom we are indebted for permission to publish it.

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THE LESIONS OF LATENT SYPHILIS.—The lesion of latent syphilis repeats the essential pathology of the hard chancre and of the secondary and tertiary lesions of the active stage of syphilis, in that it is predominantly vascular and perivascular, and that the infiltrations are derived from the proliferation of cells *in situ*. Each localization of the spirochæte leads to the production of what is essentially a miniature chancre. The presence of plasma cells and lymphocytes in the tissues in the form of localized perivascular infiltrations may be taken as the criterion for the presence of *Spirochæta pallida*. The organism, therefore, persists in the tissues, producing slight lesions leading eventually to fibrosis and atrophy of the parenchyma. Clinical symptoms will arise only when this atrophy and fibrosis reaches such a degree that functional disturbance results. In the average case in the male this functional inadequacy appears first usually in the cardio-vascular system, and death from latent syphilis is most frequently due to cardiac insufficiency. There are, however, especial organ susceptibilities to the localization of the spirochæte; in one individual the central nervous system, in another the liver, in a third the adrenals, etc., may bear the brunt of the latent infection, so that the clinical picture and the manner of death may vary greatly, according to the organ or tissue chiefly involved.

I have never seen at necropsy a case of perfectly healed syphilis. Search, often prolonged, always reveals active latent lesions in aorta, heart, or other organ. This is as true of cases treated in the modern manner as it is of cases treated with the old mercurial method. If any difference results in the two methods of treatment it would appear to be in the more frequent occurrence of chronic hepatitis in cases treated by the arsenical

method. What the treatment accomplishes in either case is the more rapid reduction of the average active case to a stage of latency. There is no evidence pathologically that the case of syphilis ever becomes wholly free from spirochætes. The latency of the infection may last throughout the individual's life; or at any time exacerbations may take place, and the disease arise above the clinical horizon. What determines these renewals of virulence on the part of the spirochæte, whether it be due to a changed quality on the part of the organism or to changes in the resistance of the body, we do not know. The possibility of such a clinical renewal of activity on the part of the spirochæte is always a possibility hanging over the head of the individual who once acquires this infection. Even if the disease never again produces a clinical outbreak, the relatively immune syphilitic will nevertheless develop various functional inadequacies as the price of the latency of his infection. These minute local infiltrations of plasma cells and lymphocytes represent the processes of a local tissue immunity. With time this immunity mechanism in itself becomes dangerous to the individual through the functional inadequacies which it may eventually produce. Whether a consistent five-year period of treatment would finally rid the body entirely of spirochætes I cannot say, for in my material there have been no cases that have been under continuous treatment for that period of time. The fact remains, however, that in syphilitics accorded what has been regarded by the clinician as thoroughly satisfactory treatment, with complete clinical cure, latent lesions of syphilis still present themselves on microscopic examination of the necropsy material derived from such cases.—Prof. A. S. Warthin in *Brit. M. J.* 2: 236, Aug. 19, 1929.

SEPARATION OF THE LOWER FEMORAL EPIPHYSIS*

By W. J. PATTERSON, M.D., F.A.C.S.

*Assistant Surgeon, Royal Victoria Hospital and the Shriners' Hospital for Crippled Children,**Montreal*

SEPARATION of the lower epiphysis of the femur is not a common accident at the present time, but nevertheless occurs sufficiently frequently, and is of such importance when it does happen, that it is worthy of serious consideration.

The present generation can hardly appreciate the common name for this trauma because of the rapid replacement of horse and cart by the automobile, but it is called the "cart wheel" fracture, owing to the fact that it so frequently resulted from catching the leg between the spokes of a wheel in attempting to climb on or off a wagon. The condition is produced by the application of force with the knee in hyper-extension and also rotation. This explains why in so many of the cases the epiphysis is displaced anteriorly and upwards as well as somewhat to one side. Toboggan and automobile accidents, and any accident in which the body weight is thrown against the extended knee with the lower leg fixed and acting as a fulcrum, are also to be listed as causes of this fracture.

The age at which this most often occurs is between eight and fourteen years, for while the lower femoral epiphysis is present at birth and does not unite until the age of twenty years, it is during this period of between eight and fourteen that the presence of an ununited epiphysis and the stress and strain due to the physical activity so marked at that age, form an ideal combination for the production of such an accident. With each succeeding year the liability lessens, owing to the nearer approach of union, and the better protection afforded by the growing individual both from a physical and mental viewpoint.

Naturally, the accident has occurred more frequently in boys than in girls in the past, but modern tendencies in life will shortly equalize

the figures. The two cases to which I wish to refer later on were girls, and both resulted from automobile accidents.

The points which I wish to emphasize in this short article are as follows:—

1. The serious nature of the injury and the possible complications, such as injury to blood vessels and nerves and to growth.

2. The methods of treatment recommended in text-books.

3. A simple method of reduction and treatment.

The injury is serious because it is one which implicates the knee joint, either directly or indirectly, and in addition is very likely to cause damage to the blood vessels and nerves in the popliteal space. In the simple separation of the epiphysis in a transverse direction the joint is not directly involved, except by the wrench and strain put upon its capsule and ligaments before separation takes place. This always results in a marked effusion into the joint and sometimes in a hæmarthrosis. But occasionally, the epiphysis, in addition to being separated in a transverse direction from the shaft of the femur, is also split or fractured in a more or less longitudinal direction. This fracture then, of course, involves the joint directly, and, commensurate with the degree of displacement and subsequent replacement, forms a serious complication with regard to future function of the joint. The diaphysis also may be fractured, as in one of my cases.

The epiphysis being displaced anteriorly, usually as the result of the lines of force causing the separation, it follows that the lower end of the shaft of the femur is displaced backwards into the popliteal space and here constitutes a menace to the blood vessels, and especially to the nerves, so that an equinus foot or an equino-varus foot is quite frequently seen. The nerve is not often torn across but is subjected to pressure, and if this is relieved

* Read at a meeting of the Montreal Medico-Chirurgical Society on April 5, 1929.

the power will quite frequently return. During the period of paralysis, however, the tendency to deformity is present, and, owing to the concentration of attention upon the main condition about the knee joint, this condition may be overlooked.

Another serious danger in this accident is that of tetanus. Practically all these accidents are the result of out-of-door, and, chiefly, street trauma. There is very frequently injury to the skin and soft tissues, and it should be the rule that those cases showing any possibility at all of infection be given antitetanic serum. Moreover, about 50 per cent of these fractures are compound.

The last danger to be referred to is the possibility of interference with growth. This, in my opinion, has been exaggerated but it is not to be ignored. Proper and early replacement of the separated epiphysis will go a long way to obviate this complication. The atrophy which results from nerve injury should not be confounded with the loss of growth due to interference with the growth line by separation of the epiphysis, but both of these conditions together with the circulatory disturbances must be kept in mind, that their consequences may be guarded against.

Even the most recent text-books on fractures state that the epiphysis should be replaced by certain methods and maintained in position by flexing the knee and application of plaster from the toes to the groin. Some advocate open reduction, others the closed manipulation method. I am opposed to the open method, first, because I believe it is seldom if ever necessary; and, secondly, because the skin is practically always bruised and abraded, and sometimes torn, and the danger of infection is great. Practically every case can be reduced by manipulation with the knee flexed, and with downward traction on the upper portion of the tibia, with counter traction by an assistant in an upward direction on the flexed femur. But the important point which I wish to make is that it is not necessary to maintain fixation in the flexed position once the reduction has been accomplished. The knee may be extended and the application of a Thomas splint forms an excellent method of fixation. It is especially valuable in those cases where there has been much bruising of the skin, or where wounds are

present which require dressing. In those cases where the separation of the epiphysis is complicated by longitudinal fractures it is wise to make the reduction under the fluoroscope if possible, and with this aid the fracture can be much more effectively dealt with and better coaptation secured. Once the reduction of the separated epiphysis is secured there is little danger of its relapsing with the leg in a fully extended position, as long as movement is prevented. This greatly shortens the period of disability and does away with that painful process of straightening a knee which has been held in flexion in plaster for some weeks after being subjected to severe trauma. The leg should be kept in the Thomas splint for five to six weeks, or a plaster-of-Paris cast may be substituted about two weeks after reduction.

Movement of the patella and contraction of the quadriceps should be begun early. Weight-bearing should not begin under six weeks, but walking without weight-bearing should be encouraged after four weeks.

CASE 1

The first case I wish to present is that of a little girl nine years old, who, on August 5, 1928, was riding in an automobile which was struck by a train. She was thrown out, and sustained numerous injuries including a Potts fracture of her left ankle, and a separation of the lower femoral epiphysis of her right leg. She did not come under my care until August 15th, and in the meantime no attempt had been made to reduce her fractures. Her right leg was tremendously swollen, the knee was greatly enlarged and there was marked deformity. The skin was badly damaged about the knee and thigh, but there were no deep wounds. Antitetanic serum was given, and under an anæsthetic, the leg was manipulated by the method already mentioned and good reduction obtained. (See Figs. 1 and 2). A Thomas splint was applied. Perfect function has resulted in the knee. There was, however, injury to the popliteal nerve with subsequent equino-varus deformity. The nerve recovered in due time, but tendon lengthening was necessary for the equinus deformity. No shortening of the leg resulted. Full function of the knee is present. It is interesting to note that reduction was accomplished by closed manipulation, eleven days after the separation, and that an open reduction would have been a very grave undertaking on account of the skin condition and danger of infection.

CASE 2

This second case was a girl of five years who also was the victim of an automobile accident, the details of which, however, are not available. She sustained, in addition to the separation of the epiphysis, a fracture of the diaphysis on the internal side. This was wedge-shaped and showed considerable displacement and rotation. There was marked bruising of the soft parts. On the day of the accident reduction was accomplished under the fluoroscope, the only difficulty experienced being due to the rotation of the diaphyseal fragment. (See Fig. 3. However, fairly good approximation was secured as is seen in Fig. 4. The leg was put up in a Thomas splint in full extension, and in two weeks' time this was re-

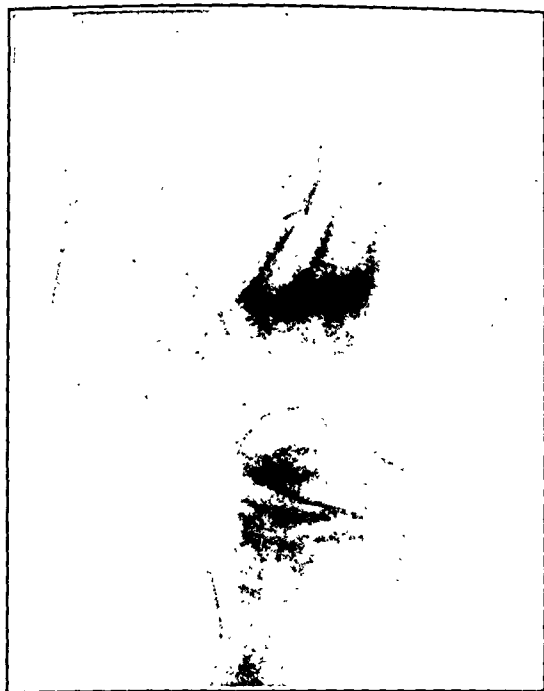


FIG. 1

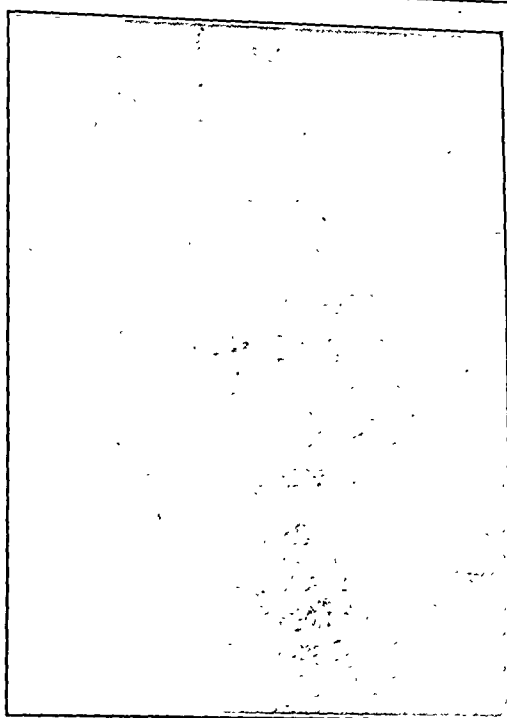


FIG. 3

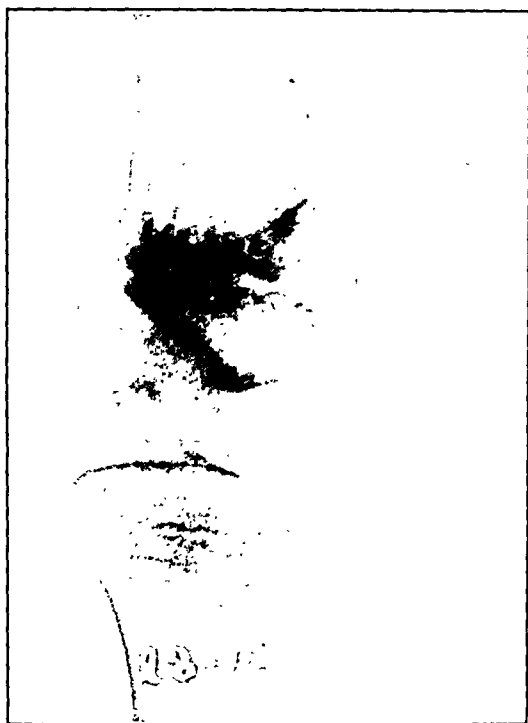


FIG. 2

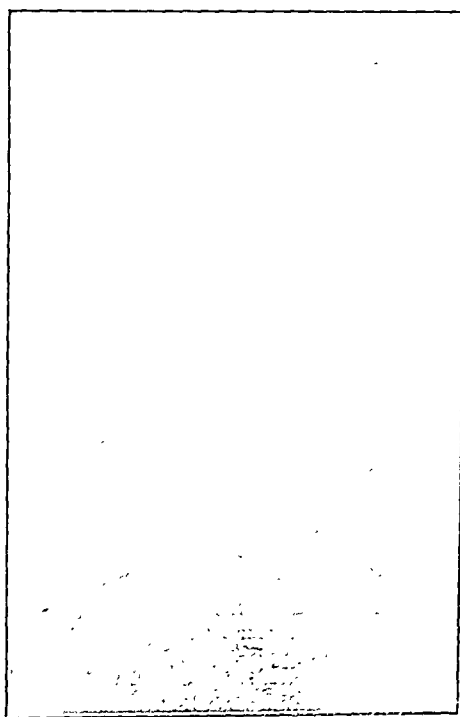


FIG. 4

placed by plaster in order to facilitate the discharge of the patient from hospital.

Full range of movement resulted in the knee and there is no shortening.

The following comment was made at the meeting by Dr. W. G. Turner.

These two cases really illustrate very clearly the anatomical replacement, and the result, of course, justified the procedure in replacing the epiphysis. I feel

very strongly that any injury that can be put in a straight line should be put in a straight line.

The second of these cases was a very difficult one, as there was so much delay in proceeding with the operation. The accident happened out in the country, and the patient was only brought into town a week or ten days after, in a very bad condition. The reduction was done, of course, in a straight line, as it should be whenever possible, as everyone knows who has had the trouble of trying to straighten out a limb after a long treatment. I think these two results are very striking and brilliant successes.

Case Reports

THREE CASES OF ENDOMETRIOSIS

By S. E. C. TURVEY, B.A., M.D., AND
WILLIAM BOYD, M.D., M.R.C.P. (Ed.), F.R.S.C.,

Winnipeg

Endometriosis has become an increasingly common finding at operations, and the following cases are reported chiefly for the rarity of certain features they present.

CASE 1

A female, age 29, married, two months pregnant. She was operated on following three definite attacks of pain and tenderness in the right iliac region with nausea and vomiting. At operation, the appendix was not diseased. A unilocular cyst of the right ovary was found, the size of a large pea, which contained hæmorrhagic, chocolate-coloured fluid. Micro-

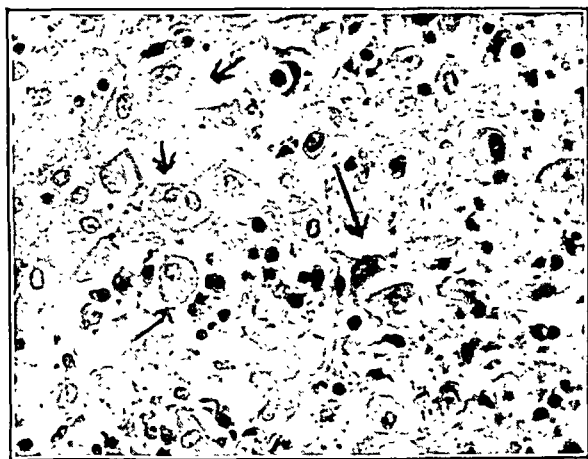


FIG. 1.—Case 1.—Decidual cells.

scopically, it was an endometrioma. And the remarkable feature was that it showed a decidual reaction, with an abundance of large decidual cells.

CASE 2

A female, age 34, complained of pain in the right iliac region, dull and aching, but occasionally sharp enough to cause nausea, though she never vomited. An indefinite tender thickening could be palpated to the right of the uterus. At operation, a corpus luteum cyst of the right ovary, into which hæmorrhage had

occurred, was found. The appendix was removed as a routine measure. A small nodule, the size of a small pea, was palpable, under a slightly thickened serosa, at the tip of the appendix. Microscopically, this nodule was a typical endometrioma.

CASE 3

A female, age 30, married. She had had a ventrofixation operation six months previously; the scar had never completely healed, and the condition was diagnosed as a post-operative sinus, due to two silk ligatures found in the wound. The sinus, when injected with an opaque solution, was shown only to extend beneath the skin. The sinus was excised. Microscopically, endometrial tissue was found, suggesting an endometrioma.

The interest of the first case is chiefly due to its value in proving Sampson's theory of origin



FIG. 2.—Case 2.—Endometrioma in wall of appendix.

from the endometrium proper, for the decidual reaction is peculiar to that tissue. Only two similar cases have been found in the literature of such an occurrence.

The second case is of interest because of the unusual situation. The third case would seem rather to support the German view that endometriomata may be due to a peritoneal metaplasia.

Acknowledgments are due to Drs. B. J. Brandson, J. E. Lehmann and A. M. Campbell for permission to use their cases; and to Miss L. Nason for preparing the photomicrographs.

A CASE OF ACUTE BACTERIAL ENDOCARDITIS*

BY A. P. HART, M.B., AND
L. N. SILVERTHORNE, M.B.,

Toronto

The following case of bacterial endocarditis presented interesting clinical symptoms.

History.—Barbara McL., aged 13, of Canadian parentage, was admitted into the wards of the medical division of the Hospital for Sick Children, on March 24, with a diagnosis of rheumatic carditis, rheumatic endocarditis, acute bacterial endocarditis, encephalitis.

The family history was negative. She had had measles in 1919; scarlet fever in 1922; whooping cough in 1921; and two attacks of rheumatic fever in the last 2 years, the first of which was quite severe.

The parents also stated that because of the rheumatism she had been kept at home for the past six months, but had not lost weight and was apparently perfectly well.

She had been perfectly well until two weeks prior to admission. At this time she complained of pain in the right ear for two or three days; there was no discharge. At the same time she became tired and listless with a poor appetite. One week later the mother noticed she was quite feverish and a physician was called. For the next few days it was noticed that her urine was darker in colour than usual and there was a slight frequency. During this week she vomited a small amount of clear fluid two or three times daily. Three days before admission she became drowsy and complained of slight headache. The drowsiness increased until the time of admission.

Examination on Admission.—On seeing this child in the admitting room, the first impression was that she was suffering from some form of encephalitis. She was acutely ill with a temperature of 105°, with a mask-like facial expression, very drowsy, lethargic with a weak encephalitic cry like that of an extremely ill infant.

* From the wards and laboratories of the Sub-Department of Pædiatrics, University of Toronto and of the Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.B.

Read at the seventh annual meeting Canadian Society for the Study of Diseases of Children, Hamilton, May 27, 1929.

The eyes reacted to light, and the pupils were regular and equal. The lower conjunctival membrane on the right side showed a shower of petechial hæmorrhages. The eye-grounds revealed a number of retinal hæmorrhages with white central areas which were approximately $\frac{1}{8}$ cm. in diameter. The drum membranes of the ears showed no sign of past disease.

Petechial hæmorrhages were seen on the skin, distributed diffusely over the whole anterior part of the chest, with some on both arms and on the back. These increased in number while the child was in the admitting room.

A few petechiæ were found on the buccal mucous membrane and a shower of white-topped embolic hæmorrhages was seen on the soft palate. The throat was the seat of diseased tonsils. The spleen was definitely palpated (in the admitting room). The chest showed nothing of note.

No definite cyanosis was present but the colour was pale, not the "café au lait" so often described. The whole præcordium heaved with the heart beat. Percussion revealed a greatly enlarged heart, the left border in the 3rd interspace was 6 cm. out; in the 5th interspace it was 10 cm. out. A long blowing systolic murmur was present in the mitral area, propagated to the axilla.

Nervous System.—The child was in a state of mental stupor with a mask-like facial expression. On testing the cranial nerves a palatal paralysis was noted. Pain was complained of on extreme flexion of the neck. Kernig's sign was positive. The knee jerks were hyperactive. Long continued clonus was obtained at both ankles. Plantar stimulation gave an extensor response on the right side.

Laboratory findings.—The urine showed a slight trace of albumin. Red blood cells were 5,920,000 per c.mm. with a hæmoglobin content of 80 per cent. The white blood cells numbered 34,000 per c.mm. with 82 per cent polymorphonuclear leucocytes. One capillary resistance test was negative. Bleeding and clotting times were normal. Platelets were 200,000 per c.mm.

Blood culture showed the presence of *S. viridans* at the end of 48 hours.

Cerebrospinal fluid.—On admission this was clear, under slightly increased pressure, with a count of 990 cells, 82 per cent lymphocytes, a

positive Noguchi test and film formation in 24 hours. On March 28th the fluid was slightly yellow in colour but clear, with 550 cells, 60 per cent lymphocytes, and still with a positive Noguchi. Culture of this fluid showed a growth of *S. viridans*.

Course in Hospital.—The temperature ranged between 102° and 105°. The child progressively became more drowsy and in the last 24 hours developed a marked spasticity of the arms, holding them in a flexed position. She gradually became comatose and died at 12.40 a.m., March 29, 1929.

AUTOPSY

On opening the thorax the pericardium showed petechial hæmorrhages on both parietal and visceral surfaces. There was no pericarditis. The heart was definitely enlarged, measuring 14½ x 10 gm. A coronary embolus was seen in the arterial wall over the left ventricle. The colour of the myocardium beyond this embolic mass was pale and it was of a softer consistency. The wall of the right ventricle showed no signs of active inflammatory change. The left auricle appeared enlarged and on its upper medial surface there was a mural thrombus about 1½ cm. in diameter. This thrombosed ulcerated area was raised above the surface of the auricular wall. It was quite friable and small pieces were broken off. The free margins of the mitral valve were studded with a few scattered fresh, firm, yellowish vegetations. Similar lesions were noted on the tricuspid valves. They were conglomerate and the largest was the size of the head of a pin. The valves all appear to be thickened toward the base and were of a whiter colour than normal. Microscopically, the picture of the heart as a whole was that of a bacterial endocarditis engrafted on an old rheumatic condition.

The liver showed a chronic passive congestion. The spleen and kidneys showed the presence of many petechial hæmorrhages.

The spleen showed a number of small infarcts surrounded by zones of leucocytic infiltration outside of which was a zone of hæmorrhage. In the kidneys some of the glomerular tufts were plugged with emboli. Scattered throughout the interstitial tissue was seen a moderate degree of lymphocytic infiltration.

Sections cut through various areas of the brain, both cortex and medulla, showed the presence of small embolic lesions. In places the lesions were hæmorrhagic. In addition to these embolic lesions there was a low grade meningitis with increased fluid in the pia arachnoid space.

COMMENT

Although the literature is extensive in its report of cases of bacterial endocarditis in adults, most authors agree that this malady is a rarity in childhood. Needleman¹ describes the symptomatology in an excellent manner and points out the rarity of the disease in children. This author also believes that small multiple cutaneous emboli are pathognomonic of bacterial endocarditis. Schlesinger² also mentions the fact that bacterial endocarditis is uncommon in childhood. He states that pericarditis is a rarity in bacterial endocarditis and yet is found commonly in rheumatic affections of the heart. This fact, along with the uncommon finding of bacterial endocarditis in children, is evidence against bacterial endocarditis being a malignant form of the rheumatic infection. Rost³ draws attention to the incidence of rheumatic heart disease as the chief predisposing factor to bacterial endocarditis and claims that all statistics endorse this statement. In his series of 12 cases of bacterial endocarditis, 10 had an early rheumatic fever and a rheumatic carditis which was verified at autopsy. In 9 of Rost's cases a nonhemolytic streptococcus was obtained from the blood culture and *B. influenzae* in one. This author states that the pathological findings are identical with those in adults. He draws attention to the white-centred petechiæ occurring on the conjunctival mucous membrane; this finding was present in the case under discussion. An emphasis is laid on cerebral lesions, which was the cardinal clinical finding in this child, noted on admission. Rost also points out that in his series the cause of death was most often cerebral embolism. Another finding similar to the case presented was the presence of petechiæ in the oral cavity. Blumer⁴ in a very thorough discussion of bacterial endocarditis contributes some interesting information. He mentions petechiæ occurring in crops, especially on the conjunctival mucous membrane. Especially interesting is his discussion of the nervous mani-

festations. It will be noted under our laboratory findings that the cerebrospinal fluid was clear, with a cell count of 990, lymphocytes predominating and film formation in 12 hours. From this finding we had thought of the possibility of tuberculous meningitis since some authorities place a great deal of diagnostic import on the film formation in tuberculous meningitis. However this was not the case, as *S. viridans* was isolated from the spinal fluid. Blumer states that this organism has occasionally been found in this fluid. Blumer also draws attention to the retinal changes and in his article mentioned "oval hæmorrhages and miliary white foci" occurring in the retina, which was part of the picture in our case.

White² in an article on endocarditis in early childhood states that although endocarditis in infancy is rare, yet it is an entity and more often of a septic nature than rheumatic. Oille, Graham and Detweiler⁶ describe a case of streptococcal bacteræmia in endocarditis, and although the usual clinical signs of meningitis were absent they obtained a Gram-positive diplococcus from a turbid spinal fluid. Blood cultures were positive for *S. viridans* in this case. Smith, F. J. *et al.*⁷ also cite a case of bacterial endocarditis with meningeal signs in which a tentative diagnosis of syphilitic meningitis was given; later, they recovered *S. viridans* from culture of the spinal fluid. Antimeningococcic serum was given in this case, but they attribute the clearing up of the meningeal symptoms as much to drainage as to the non-specific effect of the serum.

CONCLUSIONS

1. A case of bacterial endocarditis is reported, embodying some extremely interesting clinical findings in a female child 13 years of age.

2. There was an old history of rheumatic infection.

3. Encephalitic symptoms were the outstanding features in the case, *i.e.*, lethargy, with weak encephalitic facies and cry. From the film formation in a clear spinal fluid tuberculous meningitis was suspected, but *S. viridans* was recovered from the culture of the spinal fluid.

4. Petechial hæmorrhages, a palpable spleen, enlargement of the heart with a systolic murmur, and the recovery from the blood of *S. viridans* were the main clinical findings.

5. Autopsy revealed petechial hæmorrhages in

the heart, brain, skin and mucous membranes, with embolic manifestations in the heart and brain.

6. Finally, we find that bacterial endocarditis occasionally develops in children and that one should always suspect it in an extremely ill child with a cardiac lesion.

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A FATAL CASE OF SUSPECTED BRUCELLA ABORTUS INFECTION

Ontario Hospital, Whitby, Ont.

M. L., female, single, aged 22 years.

Family History.—Very little information could be obtained. The patient was a Barnardo Home girl and had never known her parents.

Personal History.—She came to Canada from England when about the age of 12 and had worked as domestic in a physician's home since that time. She had always enjoyed good health, although "nervous", and two years previously had had a "hysterical spell" in which she thought she was going to die. She made a good recovery after a few days in bed.

Present Illness.—She was admitted to the Ontario Hospital, Whitby, on December 19, 1928. Until two weeks previously she had been in her usual health, although out late nearly every night rehearsing for an amateur theatrical production in the church. She took her part in the play conscientiously; the next day was tired and dull, was unable to do her work, was confused and depressed at times. She was put to bed; her temperature was normal and there were no physical signs. When seen a week after the performance she was lying in bed, staring at the ceiling, and answered questions with difficulty. She said God wanted her to do some special work for Him and she thought she ought to die. She was kept at home a few days longer but there were periods of excitement and crying, along with stupor and depression.

On admission to hospital she was confused,

agitated, and difficult to keep in bed. Temperature, 99.1°. There was a gradual increase of temperature each day until December 23rd, when it became definitely of septic type with fluctuations, from 99° to 105°. The pulse became weak and rapid (120 to 140). White blood cells were about 8400. The tongue was heavily coated; an acne-like eruption on chest and back; lungs clear; no cardiac murmurs; no neurological signs. On the 24th and 25th of December there were infrequent liquid yellow stools. Blood culture was negative from two laboratories. Agglutination tests were negative for *B. typhosus* and *paratyphosus*. *Brucella abortus* agglutinated 1 to 80. The patient died on December 25, 1928. Autopsy showed moderate congestion of lungs but no other gross pathological state. Permission to examine the brain was not granted.

DISCUSSION

Several conditions were suspected before the Public Health Laboratory returned the agglutination test as above. While the patient was at home, dull, depressed and with hallucinations, dementia præcox was suggested, especially in view of the absence of physical signs or symptoms, and the history of a shut-in, seclusive, day-dreaming personality. When fever developed a week before death, and a spotty rash on the chest, many of which spots looked like vesicles,

the question of smallpox or chickenpox came up. We were informed, however, that the eruption had been present in a mild form for a long time on the back, but not on the chest. Typhoid fever was thought of, especially with the appearance of liquid stools and the relatively low white blood count. Opposed to this diagnosis, however, were the rapid pulse and normal-sized spleen with no typical rose spots. The blood was cultured to see if it might yield an organism, as several similar cases have come to our experience in past years where the blood revealed the presence of *streptococcus*. *Brucella abortus* was not even thought of and would not have been diagnosed had not the Public Health Laboratory made the test for this organism. When this report was sent to us, we enquired if the patient had anything to do with cattle and learned that the family kept a cow for their own use and it was one of the duties of the patient to milk it. The milk was not pasteurized. A sample of blood and milk from this cow were sent for examination, but neither showed the presence of this organism. The source of the infection has, therefore, not been discovered.

The presence of such severe physical signs, with a fatal termination, might indicate that agglutination of *brucella abortus* should occur in higher dilution than 1 to 80. For this reason we refer to the case as a suspected infection with this organism.

ENDOMETRIOSIS.—J. V. Meigs believes that endometrioma of the abdominal wall is not an infrequent occurrence, and that it is probably a preventable lesion; he reports four cases of this condition. Aberrant endometrium may be found in many regions in the pelvis and in a few outside it. It is frequently seen in the uterine wall, the ovary, and the recto-vaginal septum. The condition also occurs in many other areas of the pelvic peritoneum, the tubes, the sigmoid, the appendix, the umbilicus, and occasionally in the inguinal canal and vulva; lesions have also been found in abdominal scars. The etiology of all these growths is probably the same. They are likely to be due to transplantation of endometrial tissue either from the uterus or ovarian hæmatomas, or from growths from "rests" of the Müllerian or Wolffian bodies in the pelvis which have been stimulated into activity by some unknown substance. This excitant may be the ovarian secretions, the menstrual blood, or some other substance. A typical endometrioma is a firm, hard tumour without capsule, which on gross section shows small cystic areas containing bloody fluid,

and microscopically a glandular structure with characteristic uterine stroma about it, and frequently areas of smooth muscle. Numerous theories have been advanced to explain endometriosis, but none account for the presence of all aberrant endometrium. The finding of endometriomata in operative scars seems to substantiate Sampson's theory of implantation; but there are so few cases, in comparison with the great number of operations in which the endometrium is exposed or cut across, that some other factor besides implantation may be necessary for the growth of the lesions. Microscopical diagnosis is easy, and diagnostic curettage is very important. The treatment consists in entire removal of the lesions, or in total ovarian ablation either by removal of the ovaries or by their irradiation to the menopausal dose. Greater protection of the abdominal wound during pelvic operations would probably prevent some scar endometriomata. The prognosis is excellent if the lesion is definitely understood and correct methods are used either to remove it or to cause cessation and atrophy of the growth.—Epitome, *Brit. M. J.*, Aug. 10, 1929.

Clinical and Laboratory Notes

AN APPLIANCE TO PROTECT THE HANDS OF THE RADIUM WORKER

BY HUGH MACKAY, M.D., F.A.C.P.,

*Assistant Professor of Medicine (Dermatology),
University of Manitoba,*

When a radium plaque is used topically it is our custom to invest it with oiled silk or rubber dam as a protective covering. It is well known that repeated exposures to small doses of radium rays may cause serious degenerative changes in the skin of the operator's hands. This appliance obviates this danger. Fig. 1 shows a lead block, A, $4\frac{1}{2}$ cm. square; it is covered with brass, 1 mm. thick, on all exposed surfaces. The intervening space is filled with lead. Centrally, an aperture 2 cm. square is cut through the investing brass

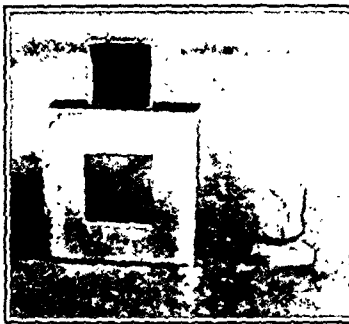


FIG. 3
Showing radium plaque
threaded.

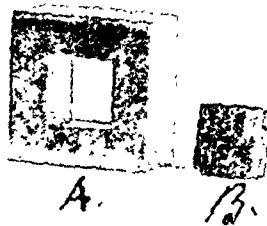


FIG. 1
A.—Lead block, $4\frac{1}{2}$ cm.
square, 2 cm. thick. B.—
Brass thimble 2 cm. square;
rubber band about centre.

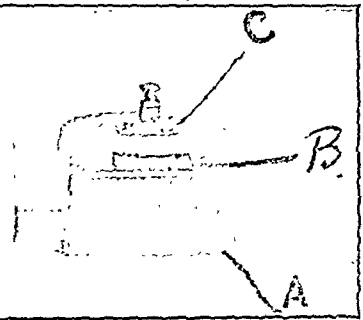


FIG. 2
C.—Radium plaque ready
to thread.

covering and underneath this the lead is hollowed out, leaving a well or cavity, $2\frac{1}{2}$ cm. square, in the centre of the lead block. A 1 mm. brass thimble (B), 2 cm. square and 1 cm. in depth, is constructed to fit accurately in the opening of the lead block. A central diaphragm divides the thimble into two approximately equal chambers, either of which may be used for the reception of the plaque. A small rubber band is stretched *tightly* about the centre of the thimble which is then placed in the aperture of the lead block (see Fig. 2), and over this a sheet of oiled silk, and above this the radium plaque with collar button attachment. The rubber band prevents the thimble from falling into the well. This collar button attachment is now grasped with the rat-toothed point of an eight-inch artery forceps and gently forced down into the well in the lead block. The plaque is immediately threaded, as seen in Fig. 3.

THE DETECTION OF MILK ADULTERATION

The freezing point of milk samples has been used since 1898 in Holland as a means of determining whether added water is present, and Mr. A. van Raalte, D.Sc., of Amsterdam, contributes an interesting note on the value of this method to the May issue of the *Analyst*. He states that it is generally agreed, as the result of very prolonged investigation, that normal mixed milk has a freezing point between -0.54° and -0.57° C. Milk with a freezing point nearer to zero than -0.53° C. is taken as indicating adulteration with water. Dr. van Raalte adds that in Amsterdam each year about 30,000 samples of milk are analysed—that is, about one sample for every thirty inhabitants; in 1927 only 2 per cent of such samples were found to be adulterated with water. The freezing point

test is now coming into use in the United States and in Germany, and figures found in both these countries are said to be in absolute conformity with those in Holland. Dr. van Raalte suggests that this method therefore deserves international acceptance.—*Brit. M. J.* 2: 36, July 6, 1929.

REBREATHING IN INTRATRACHEAL ANÆSTHESIA*

BY C. C. STEWART, M.D.,
Montreal

One of the few disadvantages accompanying the intratracheal method of anæsthesia is that a certain degree of apnoea results when the administration of ether is continued for periods

* From the Department of Anæsthesia, Montreal General Hospital.

lasting over one hour. It is not unusual to observe that respiration becomes noticeably shallow or sighing in character with resulting pallor and lowered blood pressure. This is due to the purely open character of the administration, as well as to the other factors which cause respiratory depression during ether anaesthesia.

So-called "open ether" as administered on a mask is in reality a semi-open or semi-closed method, varying in degree with the thickness of the covering of the mask, and on this account the carbon dioxide content of the blood is not depleted to the same extent as in intratracheal anaesthesia.

It has been customary in the past to combat this condition of apnoea by supplying carbon dioxide and oxygen at frequent intervals during the anaesthesia and especially at the end of the operation. This has proved relatively satisfactory but is usually not resorted to until a greater or less degree of acapnia has already taken place. It involves the use of extra apparatus and a certain amount of expense, and on account of the increased flow of gases may disturb the level of anaesthesia.

The following procedure has been carried out in the Montreal General Hospital and its results seem to justify its use. For all major abdominal operations the ordinary No. 24 French catheter is replaced by a No. 22 and this is inserted into the trachea and ether insufflation is begun. At the same time or later as convenient a No. 18 French catheter is introduced alongside the original one and to approximately the same depth. A soft rubber bag of 2 litres capacity with a small opening at each end is then attached to the free catheter and the

distal end of the bag is closed by a small adjustable clamp. The bag rapidly fills up and its tension is regulated by the clamp. Rebreathing takes place throughout the whole operation with marked advantage to the patient's colour and general condition. The bag may be emptied at intervals and reattached to the catheter.

It is obvious that under these circumstances less ether will be required, in some cases as little as 2 oz. an hour. Because of the slow rate of evaporation, cooling of the vapour supplied to the patient is reduced to a minimum, with the additional advantage of the warmth and moisture of the rebreathed mixture.

The second catheter may also be employed to further advantage as a suction tube in the event of respiratory obstruction caused by mucus in the trachea, and is always used as such at the end of operation.

If desirable, and especially where shock is present, the catheters may be reversed, the smaller tube carrying the ether and the larger one being attached to the rebreathing bag.

The above procedure has been carried out in hundreds of cases with satisfactory results. No after ill effects have been noted due to the presence of the catheters in the trachea.

The double tube may be used in nose and throat and face surgery leaving the auxiliary catheter free. It is then led in a downward direction over the forehead of the patient. This has two advantages. It is a most efficient drain for any foreign matter which may accumulate in the trachea and secondly the surgeon is spared the necessity of inhaling the expired air and ether of the patient.

TRANSILLUMINATION IN BREAST LESIONS.—M. Cutler calls attention to the value of transillumination as an aid to the diagnosis of breast lesions, and especially to their localization in cases of bleeding nipple. The examination is made in a totally dark room with a Cameron transilluminating electric light placed against the under surface of the breast and gradually moved for the inspection of different areas, so that any particular portion is directly between the light and the examiner's eye. The degree of translucence can be increased by compressing the breast between the hand above and the light beneath. The findings vary normally, depending mainly upon the relative content of fat, fibrous tissue, and epithelial elements. The study of 174 pathological breast conditions showed the value of the method as an aid to differential diagnosis and treatment, it being found that acute, subacute, and chronic inflammations present a diffuse opacity, which diminishes and disappears as the inflammation subsides. Solid tumours are opaque, the degree of opacity varying with their size

and location, but without affording a means of differentiation between benign and malignant tumours. Cysts containing clear fluid are translucent, and this may be of great value in differentiating carcinoma from tense deep cysts with skin adherence clinically simulating a malignant growth. Blood effusions are intensely opaque, and a traumatic haematoma shows an irregular outline disappearing as the blood is absorbed. The method is of especial value in cases of bleeding nipple in which no tumour can be palpated, and it affords a means of distinguishing between those due to a single localized papilloma and those caused by multiple papillomata, its practical importance being demonstrated by those cases in which the removal of a duct papilloma has failed to cure, while on subsequent transilluminations several opacities point to the existence of multiple lesions. When, however, the discharge from the nipple is not distinctly haemorrhagic, localization may be impossible.—*Epitome, Brit. M. J., Aug. 10, 1929.*

Editorial

A RARE SEQUEL OF VACCINATION

THE danger arising from the rare development of an acute affection of the central nervous system affecting chiefly the cerebrum, as a sequel of primary vaccination in children of school age, is being unnecessarily emphasized in the daily press by members of the Anti-vaccination League, both in England and in Wales. Two cases of this unfortunate sequence of vaccination are recorded in a recent number of the *Lancet*. One is reported by Dr. John Taylor, Pathologist to St. George's Hospital, in which a healthy woman 31 years of age, died after a primary vaccination on the seventeenth day with post-mortem findings of post-vaccinal encephalitis. The second case is reported by Sir Thomas Horder, in which a boy aged 4½ years unfortunately happened to be exposed to a developing case of smallpox, while waiting in the out-patient room of St. Bartholomew's Hospital. The child had been suffering for four days previously from a feverish attack associated with headaches and earache. On account of this exposure it was thought wise to vaccinate both him and his mother who had accompanied him. The vaccination took well, but on the eighth day after the usual four point insertion of vaccine the child became drowsy; on the eleventh day he was stuporous, and showed signs indicating some affection of the cerebro-spinal system. On the fifteenth day, as the symptoms continued, 5 c.c. of his mother's serum was slowly injected intrathecally. Following this injection, improvement set in. On the nineteenth day the child was more lively, improvement in his mental state set in rapidly and in a few days more the child had quite recovered. It is to be noted that in this case the vaccination was undertaken during the late stage of some infection of unknown character, but the striking effect which followed the injection of the mother's serum would point to the operation of some specific vaccinal antibody in the serum.

In a report by Professor Turnbull, Director of Pathology at the London Hospital, on a

previous case, he says, "I do not consider that this is a new disease though it appears to have become more common. It has been shown that the disease is not due to any special vaccinal lymph, and that it is not caused by any fault in the preparation of the lymph or any contamination of the lymph. The exact cause has not yet been discovered. Some consider that the disease is due to the vaccinal lymph itself, acting upon persons abnormally sensitive to it. Others believe that the vaccinal lymph lights up an infection lying dormant in the system, and this latter view has some support in the observation that a very similar complication may follow an attack of measles or other exanthem and also anti-rabic treatment. All authorities are agreed that the disease has nothing to do with epidemic encephalitis."

Thus far this complication of vaccination has been confined chiefly to the Netherlands and to England and Wales. In most of the cases the vaccination appeared to run a normal course until the development of the cerebral symptoms. Two committees in England have reported upon this condition, and the Ministry of Health in England has sent out orders that it must be informed of all cases in which any affection of the central nervous system develops within a month after vaccination. In the report of the Rolleston Committee it is pointed out that the risk of this development is a very slight one, as 51 deaths only were reported in a period during which approximately 2,000,000 vaccinations and re-vaccinations were performed, and more than 3,000,000 charges of government lymph had been issued. It is also pointed out that it is a complication that has almost never followed vaccination in infants under two years of age, and is of equal rarity in the re-vaccination of older children or adults. Two recommendations have been made. By order of the Health Department four insertions of vaccine have hitherto been made in each primary vaccination. This many medical officers of health consider to

be an unnecessary amount, and it is recommended by the Committee that vaccination should be performed before the child is two years old, and that one insertion only should be used at that early age; and that re-vaccination should take place between 5 and 7 years and between 14 and 16 years. In the Netherlands primary vaccination was effected for the most part at the school age, and it is when given at this age that the cerebral symptoms are most liable to develop. Influenced by this fact, a temporary suspension of primary vaccination at the school age has taken place in that country.

For the past few years smallpox of a very mild type has existed in many districts in

England and America, but severe cases with fatal ending, appear from time to time, indicating what might take place if the immunity secured by vaccination is neglected by a community. Canada had her lesson two years ago, in the development of the disease in an extremely malignant form in the city of Windsor. Although encephalitis as a sequel of vaccination has not, to our knowledge, appeared in this country, it would be advisable to follow the advice of the Rolleston Committee. Vaccination should be performed before a child reaches the age of two years, and the number of vesicles should not exceed two.

A. D. BLACKADER

THE VALUE OF THE BACTERIOPHAGE

THE laboratory evidence in support of the therapeutic value of the bacteriophage is very strong. It kills and dissolves bacteria in large numbers, and does so without any of the violence to the tissues which is so apt to result from chemical bactericidal agents. It can permeate tissues and, relatively, is innocuous, although repeated inoculations may lead to an increased susceptibility to infection. It also not only acts on bacteria directly, but increases the phagocytic powers of the leucocytes. Finally a culture dissolved by the bacteriophage is antigenic, i.e., it produces the same antibodies as do killed bacterial cultures but more rapidly and sometimes to a higher titer.

These are exceedingly valuable qualities and yet the bacteriophage is by no means taking as large a place in therapeutics as it gave promise of doing. It is not, however, a substance which can be employed indiscriminately. All bacteriophage races do not possess equal advantages. Many of them cannot "lyse" more than a single strain of bacteria, or are not of maximum virulence for their particular strains. This accounts for some of the failures which have attended its use.

Some interesting observations on the use of bacteriophage in staphylococcic infections have recently been published by Dr. N. W. Larkum, although he reminds us of the

difficulty of interpreting results in this type of infection. Its manifestations are varied and one patient does not serve as a definite control for another. He has been able, however, to bring together the reports of several authors who have employed the bacteriophage in a large number of cases of staphylococcic infections, of all varieties. As far as could be judged from the data collected the effects of the bacteriophage were more successful than could be attributed merely to coincidence. Nor could the enthusiasm of the individual worker entirely account for the favourable reports, for whereas in the bacteriophage treatment of other infections such as typhoid, dysentery, etc., many workers have given unfavourable reports, only one unfavourable report has as yet appeared concerning staphylococcus infections, and in this case the doses seem to have been inadequate.

In addition to these collected reports Dr. Larkum has been able to watch the use of bacteriophage for more than two years, as distributed by the Michigan Department of Health, and he now has over 300 individual reports which contain certain detail enough to permit of some conclusions. The bacteriophage used was all prepared from a single staphylococcic strain. It was issued with instructions to give 2 c.c. subcutaneously on successive days for two days in all

staphylococcal infections, and local applications in all conditions except furunculosis.

The summarized results are encouraging. In furunculosis, *e.g.*, the percentage of cures was 78 per cent. Nineteen per cent showed recurrences, but many of these were mild and cleared up gradually. Only 3 per cent showed no improvement.

Dr. Larkum is anxious not to draw premature or unjustifiable conclusions but he feels that a comparison between treatment of these intractable staphylococcal infections

by bacteriophage filtrates and vaccine is greatly in favour of the bacteriophage, and he hopes that its use will be extended. The bacteriophage possesses the advantage of giving no severe reaction and yet of producing apparently complete immunity. The mere percentages also do not give an adequate idea of the immediate effects which follow on the use of the bacteriophage. The lesions show early and rapid regression, the exudate becomes thin, and pain is relieved.

H.E.M.

THE SPAN OF LIFE

SUCH record as is available credits Methusaleh with having reached the mature age of 969 years before he shuffled off this mortal coil. Archbishop Ussher gives B.C. 3317 as the date of his birth. From this it is computed that Methusaleh's life ended in B.C. 2348—that fateful year in which, “in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights.” The cause of Methusaleh's death is not stated. If we invoke the law of chance, it may be surmised that he was a flood victim. Such surmising permits of speculation as to the age he might have attained had he been worthy of admission to the Ark and of a death from natural causes. But apart from such speculation he is conceded an age-record which even the most enthusiastic life-extensionist of this era dares not hope to surpass.

The Q-vitamin, or whatever the factor may have been which accounted for antediluvian longevity, seemingly lost its potency in the flood. A few centuries later Moses, great pioneer in health work, set the limit of justifiable ambition in respect of age at three score years and ten, and offered small inducement to venturing on to four score. This pronouncement has, perhaps, been taken too literally. Many have become octogenarians, and not a few have become nonagenarians, with no loss of either happiness or usefulness, and their children have called them blessed.

But Moses made no extravagant claims for his health code, and thus set an example which has not been universally followed.

King Hezekiah quite naturally went into a “blue funk” when Isaiah told him to put his house in order, and very humanly rejoiced when he was given a reprieve of fifteen years. To-day we are being told that while a few decades the average span of life has been materially increased, and it is interesting to note that, in the United States, the average extension just equals that which was recorded to Hezekiah. God's mercy in the individual case; American efficiency in the case of the one hundred per cent.

Zeal of God, according to St. Paul, should be with understanding. Should this not apply to zeal of all things? We have accomplished much within recent decades in which we may glory justifiably. But it is the part of wisdom to interpret carefully. Because of betterment in our knowledge, the infant mortality rate has been reduced dramatically. Tuberculosis destroys a much smaller proportion of the younger age-groups than formerly. Such are prominent factors in the accounting for the increase in the average duration of life. The obstetrician of the moment, if he thinks it worth while, may endeavour to quiet the wail of the latest arrival by the assurance that it has a much better chance of surviving infancy than had either of its grandparents; and also that circumstances of this time favour a more healthful existence than could have been anticipated for even its parents when they emerged into the world. But he should

hesitate about making more sweeping statements. A part at least of Isaiah's vision appears to be nearly within realization. The infant of days is becoming a rarity. The speed to which we have attained however, does not permit the child to outdistance the angel of death for the hundred years which that great optimist envisaged. Despite the cheery prognostications of eminent health enthusiasts and professors of economics, we are not within very short distance of a normal death-age of one hundred. In fact, some critical statistics-analysts lead us to the gloomy fear that the proportion of those now alive who are likely to attain a good old age is not much greater than that of preceding generations.

In England and Wales, for several years past, improvement in the death rate has been shared in by all age groups, although the gain has not been very great in the more advanced periods. In the United States there has been, on the whole, loss rather than gain in age-periods beyond forty. Statistics for all of Canada have not been collected for a sufficient number of years to allow of satisfactory analysis in this particular. It is unlikely that we have, at best, progressed farther than the mother country. As the younger age-groups increase in size, they will pass over greater numbers to the more advanced age-groups, and we shall have more people of an age suitable to cancer and the degenerative diseases. Modern methods of recreation, of preserving youthful figures, and of living in general promise no reduction in the prevalence of metabolic, circulatory, and nervous disorders. In short, babies and tuberculous youngsters are being saved, not to become Methusalehs, but rather to swell the numbers who will fall victim to the diseases or disorders of middle age.

The facing of facts need not engender pessimism, but we surely should take cognizance of the trend in death rates. Safe deliverance from the perils of infancy and youth would be much more satisfying if there were less likelihood of life terminating at or shortly after middle age. Of course effort to save the kiddies and the young should continue without slackening, but should there not be comparable effort on behalf of the forty-years-plus groups?

We cherish the hope that lessened incidence and better treatment of the infections of early life will effect reduction in the prevalence of degenerative conditions. Full co-operation of the profession with official health agencies is essential to the best results in this respect. Early and adequate treatment of syphilis should afford a measure of protection against vascular and other degenerations. Destruction of septic foci is so frequently followed by the dramatic disappearance of disabling symptoms as to warrant careful attention to such foci as a preventive measure. The judicious management of cardiac and arterial disease will surely meet with merited reward. Early recognition and prompt removal of malignant tumours should prolong many lives. This is sufficient to indicate the possibilities which lie at hand. Obviously, neither official nor non-official health organizations can deal with such conditions as effectively as with conditions which lend more readily to mass treatment, but it may be expected that such organizations will "muss in" if there is failure on the part of the profession to recognize the importance of utilizing to the full the knowledge we have of preventive methods. Should physicians avail themselves of every opportunity which presents in the ordinary course of practice, and fully cultivate their respective fields in this particular, it can scarcely be doubted that the result would be advantageous to all concerned. And until physicians apply themselves seriously to the practice of preventive medicine, we may be reasonably charged with failure, despite our more exact knowledge, to secure results comparable to those being obtained by lay organizations engaged in public health work. Once it becomes known that the profession is actively concerned in detecting and remedying disease in its incipency, the periodic health examination will become a popular birthday pastime, and there will be little occasion for the sort of publicity which most of us regard with disfavour. And in the most strictly professional way we will contribute, perhaps very notably, to lengthening and broadening the span of life.

W. H. HATTIE.

TEAM-WORK IN PRACTICAL MEDICINE

IN his thought-provoking Presidential Address, delivered before the British Medical Association at Manchester, and reproduced elsewhere in this issue of our *Journal*, Professor Burgess deals with the debt that surgery owes to the ancillary sciences, physics, chemistry, and physiology. At almost every turn the surgeon makes use of information derived from the laboratory as the result of the experimental method. What is true of surgery is also true of medicine. We are, indeed, face to face with the dawn of a new era in practical medicine. We use the word "dawn" advisedly.

It will be interesting to recall, for a moment, the various influences that have dominated medical practice and medical teaching in the past. After the close of the Greek period, say, with the death of Galen, botany came to the fore, and from the somewhat crude and unpromising efforts of the root-diggers and herbalists was born scientific botany, and, in course of much time, pharmacology. Then came anatomy, the pre-eminence of which, due on the continent largely to the work of Lieutaud, and in Britain to the influence of the Monros, the Hunters, Pott, Cheselden, and Sir Astley Cooper, persisted for two hundred years. In fact, only now does it seem to be seriously challenged. Then came morbid anatomy, the inspiration of which we owe to Morgagni, Baillie, Rokitsky, and Virchow, an inspiration that was more potent twenty years ago than it is now. To-day we are in the era of physiology and its offshoot bio-chemistry. In the past, medicine did much to aid the infant science of physiology. Now the debt is being more than repaid, and both medicine and surgery are being remade in the light of applied physiology and the experimental method. All well trained physicians will be ready to admit this. In fact, the line that separated applied physiology and experimental medicine from the art and science of medicine is all but obliterated. We need only to cite the discovery of hormones, the development of endocrinology and the chemistry of metabolism, tests for renal function, the elucidation of the vitamins, and the recent advances in the physiology of the nervous system, to illustrate the point.

As we have hinted, the time has gone by when the causes, manifestations and results of disease, are to be looked for in the various organs, and there only. The modern view is that the morbid changes that may be found in a tissue or an organ do not constitute the disease. They are only an expression of it. Disease, rather, is disturbed bodily function, not localized to any one organ, but affecting more than one, and, moreover, usually, the whole body. The case for physiology has been well put by Dr. W. E. Dixon,* in his Presidential Address delivered on July 24th at Capetown before the Section of Physiology of the British Association for the Advancement of Science, whose words in this connection may well be quoted.

"The term 'physiology' is usually used to designate the science of function, whether it is studied in broad outline and dealing with the mechanism of action or as the physico-chemical mechanisms leading up to this action. Disease means the unusual functioning of tissues, which may be the result of accident, hereditary weakness, or parasitic organisms. Generally it is wrong to speak of this as mal-functioning; the unusual functioning is physiological, and, perhaps, the best for the organism under the unusual conditions. The science of medicine, then, is nothing more than trained and organized commonsense based on physiology". And, again, "More and more is physiology being regarded as the application of physics and chemistry to the phenomena of life."

This being so, we may find here the justification for those who, in planning the curriculum in connection with the lengthened course of medical studies, gave up much of the added time to the so-called "pre-medical" subjects of physics and chemistry, and the brilliant results that are now being obtained from applied physiology and experimental medicine should go far to allay the fears of those who thought that in the new scheme of things the clinical side was being neglected. Nowadays, the close dependence of practical, *i.e.*, "clinical" medicine upon the pre-medical subjects will hardly be denied. The question is, how best to ensure that the special know-

* *Brit. M. J.* 2: 138, July 27, 1929.

ledge acquired in the preliminary years will not be forgotten but will be available for the elucidation of therapeutic problems. With the medical curriculum crowded as it is with differing subjects there is a tendency to regard these as forming, as it were, watertight compartments. The correlations that are so important are often not made. Our clinicians should be good physiologists and good chemists, and the physiologists and chemists should have a good appreciation of clinical needs. But, inasmuch as clinicians can hardly be expected to be specialists outside of their own lines they could, very properly, call in the services of those who are competent to give them advice on the special problems arising from time to time in their work.

For the student it would be well to institute courses in applied physiology and applied bio-chemistry, conducted by competent instructors, which would bridge over the gap that generally exists between the pure sciences of the pre-medical years and the applied science of the clinical years. This idea is to be put in practice, we understand, by one at least of our Canadian universities.

For the patient, there can be no doubt that a correlation of effort between the clinician and the pure scientist would be beneficial.

Not long ago, in connection with the lamented death of one of our own profession, in Toronto, the services of the physiologist and the metabolism expert were called into requisition. In such cases the special and accurate knowledge of the pure scientist may be of the greatest help to those whose duty it is to treat disease.

The ideas here brought forward are gradually becoming accepted and are being crystallized into action. Professor Burgess, for example, in the address referred to, states that the Professor of Physiology in the University of Manchester has been placed with his colleagues in Anatomy, Physics, and Pharmacology on the consulting staff of the Royal Infirmary. Should such action be contemplated here it would be well, in our opinion, to add to the number the professors of pathology and bio-chemistry. In McGill University a step in the right direction has been taken, in that the Research Professor of Physiology works in the closest harmony with the Department of Experimental Medicine. There is no doubt that intelligent team-work will, in the future, bulk more largely in connection with the efforts that are being made to prevent and control disease.

A. G. N.

Editorial Comments

DR. BLACKADER'S RETIREMENT

Those who were present at the recent meeting of the Association in Montreal, and, doubtless, others of the profession, will have learned by now of the regretted retirement of Dr. Blackader from the office of Editor of the *Journal*.

The lot of an editor is not always and altogether "a happy one", but there are exceptions, and Dr. Blackader, we know, has experienced much happiness, as his readers have had much gratification, from his incumbency of the editorial chair. In truth, the duties of an editor are onerous, requiring wide scholarship and incisive judgment, tempered with unfailing tact. Dr. Blackader has manifested these qualities in generous measure. How much his work, both in connection with the *Journal* and his chosen specialty—pædiatrics, has been appreciated can be seen in the resolution passed at the Annual Meeting, where it was decided to establish in the near future a Blackader Lectureship in Pædi-

atrics, than which, to Dr. Blackader himself, no more gratifying and fitting testimonial could have been devised.

It would be ungracious, also, if the incoming editorial staff failed to record their sense of the loss that all have sustained in the senior editor's retirement. The *Journal* will miss his untiring effort; the sense of personal loss on the part of the staff is, however, mitigated by the knowledge that the late editor can be called upon for counsel, and that, from time to time, the *Journal* will have the benefit of productions from his facile pen. This makes their task so much the easier. Dr. Blackader will be, as he phrased it himself, "a free lance," and will have none of the responsibilities of office. It is our intention to deal with these matters more adequately in the next issue of the *Journal*. In the meantime, all will join us in offering to Dr. Blackader our best wishes for his welfare in his retirement.

A.G.N.

JOHN MITCHELL BRUCE

A great figure in the ranks of medical men has passed on in the person of John Mitchell Bruce, C.V.O., M.D., LL.D., F.R.C.P., who died in London on July 7, 1929, at the age of eighty-three. Dr. Bruce was, perhaps, better known to an earlier generation of physicians, and, on this side of the water on account of his very popular text-book on *Materia Medica and Therapeutics*, which passed through many editions, and an excellent work on *The Principles of Treatment*.

Dr. Mitchell Bruce was born at Keig in Scotland, receiving his early education at the Aberdeen Grammar School. He proceeded in course to the University of Aberdeen, where he took the degree of M.A. in 1866. He graduated M.B. at the University of London, and M.D. in 1872. Following this he engaged in post-graduate studies at Vienna and other European schools, and on his return to England engaged in pathological research under Sir John Burdon-Sanderson and Professor Emanuel Klein. From 1871 onward he was connected in a very vital and stimulating way with the Charing Cross Hospital, becoming in succession Lecturer in Physiology and Pathology, Assistant Physician, Physician, and, on his retirement in 1901, Consulting Physician. From 1883 to 1890 he was Dean of the Medical School of the hospital.

In addition, Dr. Bruce held many other important medical posts, being physician to the East London Hospital for Children, to the Brompton Hospital for Consumption, and Diseases of the Chest, and to the King Edward VII Sanatorium at Midhurst. He was elected a Fellow of the Royal College of Physicians of London in 1878, and became Senior Censor and Lumleian Lecturer in 1911, and Harveian Orator in 1913. He had been, also, president of the Medical Society of London and president of the Section of Medicine of the Royal Society of Medicine. At the meeting of the British Medical Association, at Brighton, in 1886, Dr. Bruce was vice-president of the Section of Pharmacology and Therapeutics and again, at London, in 1895. In 1899, at the meeting at Portsmouth, he was president of the Section of Medicine, and, at London, in 1910, he delivered the address in medicine, taking as his subject "The dominance of etiology in modern medicine."

He was created C.V.O. in 1919, and in the same year received the honorary degree of Doctor of Laws from the University of Aberdeen.

Dr. Mitchell Bruce was also noted for his literary activities. At one time he had been on the staff of the *Medical Times and Gazette*; later, co-editor of the *Practitioner*, and assistant editor of Quain's *Dictionary of Medicine*. His Lettsomian Lectures on "The diseases and disorders of the heart and arteries in middle and advanced life, and his Lumleian Lectures on

"Cardio-vascular degeneration, "were notable achievements.

Dr. Bruce was a great physician and clinical teacher and exerted a great influence upon those with whom he came in contact. Of a sterling and gracious personality he possessed to a rare degree the esteem of the medical profession. One of a notable group, with Burdon-Sanderson, Lauder Brunton, Ferrier, and Klein, Bruce laid the foundations in the seventies for that scientific development in physiology, pharmacology, and histology which was destined to prove so fruitful. His influence lives on.

A.G.N.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

Canada, particularly Canadian Medicine, as represented by the Canadian Medical Association, may very rightly be proud of an experiment which came to a successful conclusion in Toronto on Saturday, August 10th, when nine candidates out of a class of twenty-three were approved in the Primary Examination of the Royal College of Surgeons of England.

At our meeting in Regina four years ago it was decided to invite the Royal College of Surgeons to hold the Primary Examination in Canada. Naturally, numerous conferences and the interchange of many communications were necessary to bring about a modification of a plan which had been in operation in one place for nearly a century. We in Canada were just as anxious as the officials of the College that the examination should be in every particular a replica of that conducted in London. To this end it was agreed that the College should send out four of its regular examiners while we were asked to nominate two assessors to assist.

On Monday, August 5th, the following gentlemen, all of London, England, arrived in Toronto, Sir Holburt J. Waring, officially representing the Royal College of Surgeons; Professor William Wright and Professor W. E. LeGros Clark, anatomists; and Professor C. Lovatt Evans and Professor John Mellanby, physiologists.

The Canadian Medical Association nominated Professor J. P. McMurrich and Professor Chas. Best as assessors in Anatomy and Physiology, respectively.

On Tuesday afternoon the candidates were given three hours to write the paper in Anatomy, while on Wednesday afternoon a like time was set aside for the paper in Physiology. On Friday and Saturday the viva voce examinations were held in the Anatomical Building of the University, each candidate being interrogated for a period of forty minutes—twenty in anatomy and twenty in physiology. The London professors examined alternately while the Canadian Assessors were present throughout.

At the conclusion of the sessions of each day,

a conference was held, attended by the four Examiners, the two Assessors, the Official Visitor, Sir Holburt J. Waring and Dr. T. C. Routley, the Superintendent of the examination. The marks of the candidates who had completed the examination were then tabulated and a decision arrived at as to whether each had been approved or referred. Immediately following this conference the Superintendent of the examination received each candidate and informed him as to the result. (This method has much to commend itself to those who are subjected to the ordeal of an examination).

The viva voce part of the examination was visited by many Fellows of the Royal College, also by several prominent surgeons from the United States.

The candidates appeared to be unanimous in their expressions of appreciation of the fairness of the papers and the practical nature of the orals.

The examiners were kind enough to state that the arrangements for the examination were in every particular quite as satisfactory as in London.

Before adjournment the representatives of the College together with the Assessors, Dr. Primrose, who had returned from England expressly for the purpose of attending the examinations, and Dr. Routley, discussed thoroughly many of the aspects of the examination, both as to present and future. Suffice it to say at this juncture that all agreed that the experiment had been well worth while.

The following candidates were successful:—George Alexander Fleet, Montreal; Frank Lappin Horsfall, Montreal; Hubert John Muth, Springside, Sask; Hyman David Isaacs, Winnipeg; Julian M. Bruner, Rochester, Minn.; Jack Hesketh Beasley, Toronto; Lloyd Reath Olver, Sydney, Australia; Ralph Marnham, England; Vithal Nagesh Shirodkar, Bombay.

This account would be incomplete without a word of thanks being extended to Professor McMurrich, Professor Best, Professor Watt, Drs. Linell, Cates, Hyland, and all others associated with them for the splendid services rendered in arranging the details of the examination. It was a real privilege to act as Superintendent of the examination working in co-operation with such a delightful group of examiners.

T. C. ROUTLEY

INDUSTRIAL HAZARDS AND THE MANUFACTURE OF ARTIFICIAL SILK

It seems to be almost inevitable in connection with various industries, especially those conducted on a large scale, that there should be inherent in them special dangers to the operatives, both in life and limb. Some of these dangers are gross and, as it may be termed,

mechanical, leading to wounds of all kinds, fractures, dislocations, and even death; others are more subtle, more insidious in their onset and course, more apt to affect special organs and systems, and more difficult of diagnosis. Such may be termed toxic, and are, naturally, apt to be met with in connection with industries that involve chemical manipulations. The classic example of the latter type is the necrosis of the jaw that used to attack the workers in the match factories in the days when yellow phosphorus was used. New industries frequently bring in their train new dangers or resurrect old ones. The manufacture of high explosives leads to cases of trinitrotoluol poisoning, to cite only one instance. Now we are beginning to hear of certain dangers attendant upon the production of artificial silk, an industry that has developed in a phenomenal way within the last few years.

The manufacture of artificial silk resembles, in a general way, the manufacture of photographic film, as there are both "acetate" and "nitrate" processes. The acetate process, fortunately, is the predominating one. At a certain stage in the process the alkali-cellulose is treated with carbon bisulphide in a hermetically sealed mixer or "churn." When the reaction is concluded the gases are removed by suction, but the workman has to put his head inside the container in order to remove the orange coloured adhesive mass that is produced. Now, as small a proportion of carbon bisulphide as 0.3 part in 10,000 parts of air is competent to produce the slightest manifestations of poisoning, which are, headache, nausea, and muscular weakness. It is not surprising, therefore, that distressing and even dangerous symptoms are sometimes produced. In addition to those mentioned, cases have recently been reported in which delirium, loss of muscular power, almost complete defect of sensation and sometimes amblyopia have occurred. Similar cases of carbon bisulphide poisoning were recorded in years gone by, in connection with the "Parkes" or "cold cure" method of vulcanization of rubber, but the special regulations established to deal with this menace have been so successfully applied that the matter had been almost forgotten, until artificial silk came into vogue.

The risk from carbon bisulphide poisoning is not the only one to be reckoned with, moreover. Sulphuretted hydrogen, which is generated at the spinning troughs, is also provocative of unpleasant symptoms. A small amount of this gas, not more than 1 part in 10,000 parts of air, is sufficient to produce photophobia, sharp pain, and conjunctivitis.

It is well for the profession to be informed upon this important matter, for, with the establishment of large artificial silk factories in

Canada, it is not improbable that cases of carbon bisulphide and sulphuretted hydrogen poisoning will be met with here from time to time.

A.G.N.

AN ACTIVE RESEARCH DEPARTMENT

We have to acknowledge the receipt of a beautifully bound volume containing Selected Articles from publications during the past ten years of the Department of Pediatrics in the University of Toronto, and from the Research Laboratories of the Hospital for Sick Children. The volume is dedicated to Miss Angelia M. Courtney, director of the Laboratories, "on the completion of twenty years work on the study of the metabolism of children." During this period she has carried out many important researches and has published numerous valuable papers, and although in many of them her name is associated with the names of other workers, yet in all she has been the directing head. During the first ten years her investigations in infant metabolism were conducted in the Babies' Hospital of New York under the direction of Dr. L. Emmett Holt. During the last ten they have been pursued in the Research Laboratories of the Department of Pediatrics in the University of Toronto under the direction of Dr. Alan Brown, and with the assistance of Dr. Gladys Boyd and other members of the staff of the hospital. It is with these last ten years of her work that we are chiefly concerned, as it was during this period that the researches reported in this volume have been carried out.

The volume is a most interesting one, and all the papers in it have a definite value. It opens with the full list of the publications and researches of Miss Courtney.

The first four papers in the volume contain the report of Miss Courtney's investigations of problems in the disorders of metabolism arising from deficiencies or excess in certain constituents of infant foods. These papers are followed by a series reporting the investigation of the metabolism of salts in the nephritis of childhood by Miss Courtney and Dr. Gladys Boyd. Other series follow by Dr. Boyd on Nephrosis in Children, on the Treatment of Diabetes in Children, and on the evidence of the Regeneration of the Pancreas in an Insulin-treated Child with Diabetes. Following these appears a series of papers by Dr. F. F. Tisdall and Dr. Drake, on the Carbohydrate Metabolism of Infants under conditions of disordered nutrition and acute intestinal intoxication. Papers detailing important researches also by Dr. Tisdall and Dr. Brown are presented on the effect of ultra-violet rays on rachitic infants, of heliotherapy on bone tuberculosis, and on calcium and phosphorus metabolism in patients

with fractures. Another valuable series of investigations are reported by Dr. Brown and Dr. Tisdall on the anti-rachitic effect of sunshine and skyshine at various seasons of the year, and on the power of various kinds of special window glass to permit the passage of the ultra-violet rays in light. In addition to these valuable papers chronicling research, a series of important clinical papers are also contributed to this dedicatory volume. Among others we note the following, an essay on the clinical manifestations of enlarged thymus, by Dr. E. A. Morgan; a clinical and metabolic study of aerodynia, by Dr. Alan Brown and Dr. Courtney; types of thrombopenic purpura hemorrhagica, by Dr. George Smith; blood transfusion, by the late Dr. Bruce Robertson and Dr. Alan Brown, and a study of fungi in diseases of the skin, by Dr. H. A. Dixon. In all, sixty valuable papers are reported in this volume as the work of ten years; an amount of work which must be regarded as not only very complimentary to Miss Courtney but a great credit to the Research Laboratories of this Department of Pediatrics, and to the stimulating direction of Dr. Alan Brown.

A. D. BLACKADER

SURGEONS AND THE LAW

Physicians occasionally, surgeons more often, come at times into unpleasant, not to say disastrous, conflict with the law. The former have been prosecuted for revealing what are commonly termed "professional secrets," but are rarely accused of malpractice. The latter, not infrequently, have been sued for performing some operation alleged to have been unauthorized, or for obtaining results somewhat short of what the person operated upon had expected.

With the increased dissemination of medical knowledge among the laity the laity have become more critical, and the general use of the x-ray often reveals deviations from the normal, notably in connection with the setting of broken bones, which the unscientific person may seize upon, honestly or dishonestly, for the purpose of obtaining damages. And, further, since the kind of evidence that satisfies the scientific mind is not, necessarily, the kind of evidence that satisfies the legal mind, injustice occasionally is done. Surgeons, for example, have been mulcted in damages because the x-ray picture had shown that after a fracture had been set the fragments had not been restored to perfect apposition and alignment. It is clear to medical men, of course, that the functional result, rather than the anatomical one, is the important thing. In many cases a perfect anatomical result is unnecessary and, indeed, unattainable, except by open operation, which may not be justifiable. Not long ago, in England, a case came to trial where an able surgeon, who had, it was proved, taken most ex-

ceptional care for the well-being of his patient, was sued because a fracture, perfectly treated, was followed by a Dupuytren's contracture, a complication well known and not always avoidable, even in the light of present day knowledge. A few more cases of this kind and surgeons will think twice about operating without an express undertaking on the part of the patient and his friends that the operator is not to be held responsible for possible but unavoidable ill-results. But a new hazard besets the surgeons.

Quite recently one of the best known surgeons in Paris was asked by a patient to improve the "aesthetics" of her leg. She was a *couturière*, and her success in her calling depended on the smartness of her personal appearance. The surgeon operated. The unexpected happened; infection set in and the leg had to be amputated. Suit followed and damages in the amount of 200,000 francs were awarded. The case has led to much discussion in medical and legal circles, and the comments of the trial judge, in particular, have caused much feeling. The decision was based not on any allegation of mistake on the part of the operating surgeon, whose skill, indeed, was beyond question, but on the ground that the operation was not justified on pathological grounds. If the matter rests here cosmetic surgery will have to go. Apparently, this is a new form of antagonism between medicine and law. We understand that the General Medical Association of France has decided to intervene in the matter and that the case is to be appealed.

A.G.N.

"THE ANTISEPTIC"

The Silver Jubilee number of our Indian contemporary, *The Antiseptic*, so-called after Lister's immortal discovery, lies before us, and is full of interesting reading. Twenty-five years ago there were only two medical journals in north India, the *Indian Medical Gazette* and the *Indian Medical Record*, and none of importance in south India. The problems relating to the profession of medicine were numerous and calling for solution. To inform and unify the medical profession was the first crying need. Accordingly a new journal was established through the efforts of the Honorable Dr. U. Rama Rau and the late Dr. T. M. Nair, the latter of whom

became its first editor. The aims of *The Antiseptic* are summed up in its first issue in the following words:—

To bring the medical profession in India to its legitimate place in the forefront of all learned professions will require the united efforts of all its members, official and non-official, European and Indian. The parliament of man and the federation of the world is still a poetic dream but it rests with the medical profession in India and in Great Britain too whether the idea of a united medical profession in India, a General Medical Council for India, and a Medical Registration Act for India should remain a dream indefinitely or be brought within the range of practical politics within the next few years.

Besides these laudable aims there were other problems to be attacked, including improvement in the relations existing between the members of the state medical service and the independent medical men, the raising of the status of the various classes among Indian medical practitioners, medical education, and, by no means least, the enlightening of a whole people in the matters of vaccination, sanitation, and public health generally.

The journal prospered in the face of great difficulties and is a monument to the foresight and courage of its founders. On the death of Dr. Nair, ten years ago, the destinies of *The Antiseptic* have been guided most efficiently by the Honourable Dr. U. Rama Rau, whose activities have been widespread in the effort to better the condition of his fellow countrymen. As an example of his valuable work may be cited the establishment of health journals which are published in four of the most used languages, English, Tamil, Telegu, and Canarese.

It is not for us, at this distance, to presume to judge of the medical needs of India or of the value of the efforts of the Indians themselves to improve their local conditions in regard to medicine and the public health, but, at least, it seems clear that the call was there and the opportunity great, and that *The Antiseptic* has played a forcible and meritorious part in bringing about reforms. The journal has our best wishes for success in its attempts to better the condition of the Indian people, to improve the status of the profession, to bring about more harmonious working between its members, English and native, and to raise the standards of medical service and medical education.

A.G.N.

Fourteen cases of scarlet fever have been traced by Ruth Tunnicliffe and T. T. Crooks to three healthy carriers of scarlet fever streptococci. They used the opsonic test for the identification of scarlatinal streptococci which is simple and concise and can be carried out in any public health laboratory almost as quickly and accurately as can the cultural diagnosis of diphtheria. Immunological methods for the detection of

carriers of scarlet fever streptococci may now enable us to check scarlet fever outbreaks just as we do diphtheria epidemics. Tunnicliffe and Crooks conclude that as more experience is gained it is hoped methods may soon be introduced not only for determining the quarantine periods for convalescent carriers but also for the isolation of healthy carriers of scarlet fever organisms.

—J. Am. M. Ass., 1929

Special Articles

ON EPILEPSY

A Review

By A. D. BLACKADER, M.D.,

Montreal

The problem of the morbid cause or causes underlying the development of epilepsy is with our advancing knowledge considered as much more complex than it was thought to be when Sir Percy Sargent in his presidential address¹ a few years ago attributed it unhesitatingly to lesions in the brain. Attention has gradually been called to the fact that the existence of even comparatively gross lesions in the brain does not justify the assumption that these are the primary and most important factors underlying epileptic seizures.

The literature on epilepsy has increased in late years to voluminous proportions and is still controversial in character, but during the past year two able reviews have appeared in which the recent advances in our knowledge of the subject are discussed. Sir James Collier² made epilepsy the text for his Lumleian lectures delivered at the Royal College of Physicians, and in the May issue of "Medicine,"³ Lennox and Cobb, of Harvard University, have presented us with a very complete review of the numerous investigations made during the past few years and of the many hypotheses presented regarding the causation of this complicated disease. The present paper is an attempt to present the more important facts appearing in these reviews, and in still more recent papers to our readers.

At the outset of his first lecture Sir James Collier⁴ pointed out that epilepsy is met with both in birds and in mammals, in horned cattle somewhat rarely, but in carnivora and primates more frequently. In all of them the several types of the disease are similar to those met with in man. Hereditary transmission has been noticed to occur in many stock animals through several generations.

Three classes of sufferers from this affection may, according to the lecturer, be distinguished: the so-called idiopathic cases in whom no pathological lesions have been found; the cases associated with and apparently in great measure dependent on organic lesions in the brain; and cases in which the attacks are symptomatic of special constitutional disease or intoxication. It is to be noted, however, that in the majority of individuals no form of irritation will give rise to epileptic manifestations⁵.

Lennox and Cobb⁶ protest against any attempt to divide of epileptics into classes, claiming that all patients having seizures, from whatever apparent cause, possess in some degree a special susceptibility to the development of these attacks, and consider that as we have no means of determining whether this susceptibility forms ten or ninety per cent of the total influence making for seizures, any separation of epileptics into classes, except for the convenience of clinicians, only obscures the main problem of the causation. They assert as a fact that some abnormal condition of the brain cells exists in all cases in which seizures occur.

Special Factors of Etiological Importance

These authors consider that three factors⁷ are of etiological importance in the production of the seizures. These factors are:—(a) organic abnormalities in the structure of the brain, or its covering; (b) functional abnormalities in the cells of the brain increasing their convulsive reactivity; and (c) abnormal conditions in the body tissues outside the brain.

That some special instability of the brain cells plays an important part in favouring the development of the seizures appears probable when we consider that among individuals having organic brain lesions or some functional disturbance in their metabolism *only a small proportion* react to this abnormal condition with epileptic seizures. According to the statistics of the late war, epilepsy developed only in from four to five per cent of individuals who suffered from gunshot injuries to the brain, and this low rate was fairly constant in all the combatant forces. Collier⁸ emphasizes the etiological importance of this low percentage in his Lumleian address and stated that in his experience there is no lesion of the brain, whatever be its nature or its position, that will certainly induce the development of epilepsy. On the other hand, there is hardly any lesion of the brain which may not give rise to epilepsy. Of ten tumours of the brain, identical in nature, size, rate of growth and position, one may produce epilepsy early and continuously, while the other nine fail to do so. Of twenty similar wounds of the brain, one is followed by epilepsy and the others are not. Furthermore, the irritation which may arise from special adhesions, tissue tractions, and dislocations, appears to have little definite influence in the great majority of cases. Obviously, therefore, the lesion in the brain is *not the only* important factor responsible for the development of epilepsy.

1. *Brain* 44: 312, (November) 1921.

2. *Lancet* 214: 587, Mar. 24, 1928; Mar. 31, 1928; April 7, 1928.

3. *Medicine* 2: 105-290, May, 1928.

4. *loc. cit.* p. 587,

5. COLLIER, SIR JAMES—Address on Epilepsy *Lancet* p. 1163, June 1, 1929.

6. *loc. cit.* p. 109.

7. *loc. cit.*, p. 130.

8. *Lancet*, 214: 590, 1928.

Hereditary or Congenital Instability

The question whether any hereditary or congenital weakness is present in the cerebral tissues of epileptics is still a matter of controversy, but in the opinion of the majority of writers on the subject we have to deal in a considerable percentage of cases with an hereditary or congenital instability of nerve centres, varying greatly in degree in different individuals. C. W. Burr⁹, after a study of 1,449 cases, states that while there is no strong evidence of any direct inheritance of epilepsy, there is evidence of an inherited or congenital instability of the nervous centres manifesting itself as a predisposition to nervous disorder, the specific form of which is dependent on external causes. Brain¹⁰ in a study of 200 cases found a family history of convulsions in 28 per cent as compared with 10 per cent in other patients attending the hospital for nervous diseases. Myerson¹¹ is of the opinion that a hereditary factor in epilepsy has not been proven, but there is a constitutional factor which may arise *de novo* in the lifetime of an individual from his uterine existence onward.

Physico-Chemical Changes in the Brain Cells

In addition to the possible presence of some hereditary or congenital fault in the brain cells favouring the development of epilepsy, we must also recognize the important influence that certain physico-chemical changes may have on the function of these cells. The central nervous system is vitally dependent for its normal functioning on a continued and adequate supply of oxygen, and R. O. Loebel¹² has shown that the oxygen consumption of brain tissue is specially high. Any anoxæmia of the brain tissues produces an abnormal instability in them, and if severe may give rise to convulsive seizures. Lennox and Cobb¹³ think it probable that deprivation of the supply of oxygen to the cells is the common denominator of many diseases in which a tendency to convulsive attacks is a feature.

Any marked change in the equilibrium of the electrolytes will also interfere with the normal functioning of the brain cells. Both ketosis and alkalosis have a very definite influence on the excitability of the tissues.

Furthermore, the functions of all the body tissues are intimately related to their blood supply, and any interference with the supply to brain cells will lead to the development of seizures. Oedema of the tissues may have a similar action. Hippocrates noted the moist state of brain cells in animals dying in convulsions, and oedema

of the brain has been advanced as an important factor in the convulsions of eclampsia.

It is important, therefore, to note that nerve cells when abundantly supplied with oxygen and with efficient nutrient material obtain the best protection against the development of convulsive attacks.

Abnormal Conditions in the Body Outside the Brain

Although our investigations thus far appear to indicate that either an organic lesion in the brain or some functional instability in the central nervous system is present in the majority, if not in all, individuals suffering from the syndrome of epilepsy, nevertheless abnormal conditions in the body outside the nervous system are now recognized as important contributing causes of epileptic seizures, and, in consequence, numerous investigations have been carried on with the object of detecting such conditions. The blood, urine and faeces of epileptics have all been meticulously examined by many, but unfortunately with no results of any definite significance. Careful observations by B. Hamilton¹⁴ on the amount in the body fluids of chloride, bicarbonate, inorganic phosphorus, total fixed base, and of calcium in the serum and spinal fluid of epileptic patients showed all to be present in essentially normal amounts. Neither does the morphology, physical properties, or Wassermann reaction of the blood afford any evidence of abnormality which may be regarded as contributing to the occurrence of convulsive attacks¹⁵.

Spinal Fluid. No definite abnormal condition has been found in the spinal fluid beyond the fact that during a seizure the spinal fluid pressure is greatly increased, apparently as a consequence of the apnoea, and the increase in venous pressure. Clinical evidence to indicate that an abnormal pressure of the fluid is a contributing cause of the seizures is lacking. Further investigations on this point, however, are called for. Prior and Edward¹⁶ report beneficial results from spinal fluid drainage in patients in status epilepticus.

Vascular Spasm. The theory of vascular spasm in the cerebral arteries as a possible cause of the seizures was discussed by both Hughlings Jackson¹⁷ and Gowers¹⁸, but later on was thrown into discredit by the statements of Leonard Hill¹⁹ that there were no nerves associated with the vessels in the brain. This statement of Hill's, however, has been shown to be an error and vaso-motor control of the cerebral vessels is now definitely established. Acting upon the view that vaso-constriction may play a part in the causation of the seizures, removal of the cervical

9. Heredity in Epilepsy, *Arch. Neur. and Physc.* 1: 721-8, 1922.

10. Inheritance of Epilepsy, *Quart. J. M.* 19: 299-310, 1926.

11. Inheritance of Mental Diseases, Williams and Wilkins, 1925, Baltimore.

12. *Biochem. Ztschr.* 161: 219-235, 1925. (Quoted by Lennox & Cobb, *Medicine* 7: 140, 1928).

13. *loc. cit.*, p. 140.

14. *J. Biol. Chem.* 65: 101-115 (August) 1925.

15. *loc. cit.*, p. 218.

16. *M. J. Australia* 2: 507, 1926. (Quoted by Lennox and Cobb *loc. cit.*, p. 189.)

17. *W. Riding Lunatic Asylum Reports* 3: 315, 1873.

18. Epilepsy and other convulsive diseases. J. and A. Churchill, 1881.

19. Physiology and Pathology of Cerebral Circulation J. and A. Churchill, 1896.

sympathetic chain of ganglia has been affected, but the result of this operation has been disappointing. In one case, however, quoted by Lennox and Cobb,²⁰ the seizures ceased for a week after the operation, then recurred, but later on disappeared entirely.

Autonomic Nervous System. Many patients with epilepsy present evidence of a lack of balance in the autonomic nervous system. Abnormalities of the gastro-intestinal tract have been frequently accused of playing a prominent part in seizures, and undoubtedly the normal functioning of this tract is of definite therapeutic value. C. A. L. Reed²¹, however, in a series of papers states that he considers epilepsy as due to a chronic toxæmia of intestinal origin, and²² that relief has followed in numerous cases upon which he has operated and removed portions of the cæcum or colon. A notable instance²³, within the knowledge of the writer, was the case of a man who had suffered from epileptic attacks since adolescence, and who was completely freed from them by resection of the ascending colon. At the present date, twelve years after the operation, no recurrence has taken place. Infection is also recognized by many as a contributing factor, and cures have not infrequently been obtained by the eradication of some focus.

Endocrine Abnormalities Numerous investigations have been made to determine the existence of any endocrine abnormality in epileptics which might indicate one or more of them as active and important factors in the production of epilepsy, but no convincing results have been obtained. Evidence has been found in many epileptics of a slight reduction in the amount of oxygen consumed, indicating a lowered basal metabolism. The administration, however, of the glands which most actively stimulate metabolism,—the thyroids, adrenals and the pancreas—to such patients, appears to increase rather than prevent the occurrence of seizures. Only a few patients suffering from convulsions show evidence of pituitary gland disturbance, antedating the onset of the convulsions, but in such the seizures appear to have some definite relation to disturbance in the gland, and improvement has followed the administration of the gland. B. R. Tucker²⁴ in 200 patients thought he found evidence of some abnormality of the pituitary in one-third of them. Twenty-eight of these were treated with gland substance and five were freed from seizures for three years.

The parathyroid glands hold a peculiar position, in that the three factors which, according to Collip, influence the production of experimental tetany, namely, tissue anoxæmia, disturbance in ionic equilibrium, and disturbance in the hydrogen ion concentration, may also by increasing irritability of nerve tissue precipitate

convulsions in epileptics. However, although Collier in his address²⁵ states that he regards tetany as closely allied to epilepsy, in only the exceptional patient is there any evidence of the co-existence of tetany and epilepsy.

ANAPHYLAXIS AND EPILEPSY

Various writers have pointed out certain resemblances between epileptic seizures and anaphylactic shock. There is little direct evidence concerning any inter-relationship between these two conditions. The two facts, however, that few epileptic patients present any reaction to skin tests, and in few do we meet with the incidence of any allergic condition such as hay fever and asthma, are certainly against the supposition that any special sensitization, or abnormal protein metabolism, is a prominent factor in any but very occasional cases.

Disorders in Metabolism

Blood Sugar. The observation that insulin hypoglycæmia in rabbits is accompanied by convulsions directed special attention to the blood sugar content in epileptics. Induced hypoglycæmia does appear to favour the development of convulsions in man, but to a much less extent than it does in animals. A slight increase in the blood sugar content may take place after a seizure as the result of the apnoea and intense muscular exertion, but there is no evidence that the blood sugar content plays any more than a passive rôle, and there is no evidence of any important disturbance of carbohydrate metabolism.

Acidosis. It is notable, however, that epileptics exhibit an unusual ability to consume and metabolize fats, and on a high fat dietary, the acid base changes induced in the blood are found to definitely lessen the excitability of the nervous centres, and in epileptics to reduce the frequency of the seizures. Ketosis may be induced by the administration of acid-producing salts, a high fat diet with limitation of the carbohydrates, or by fasting. Adult epileptics do not respond well to the condition, and it is difficult to maintain in them an effective ketosis for any time without the appearance of warning symptoms. Children, on the contrary, develop the condition on a lower ketogenic diet and respond well to the treatment. Wilder and Peterman²⁶ were able to keep a series of young children on a diet effective in inducing ketonuria for a long period, without any impairment of health, and with great improvement in the seizures. Helmholz²⁷ in the Mayo Clinic treated 91 children all under thirteen years of age, 31 per cent of whom were rendered free of attacks, and 28 per cent were definitely improved. Talbot²⁸ in Boston makes a similar report, emphasizing not only great reduction in the fre-

²⁰ *loc. cit.*, p. 158.

²¹ *J. Am. M. Ass.* 64: 1047, 1915.

²² *J. Iowa Med. Soc.* 10: 204-208, 1920.

²³ Armstrong, G. E., *Practitioner*, 117: 288, 1926.

²⁴ *Arch. Neur. and Psych.* 2: 192 August 1919.

²⁵ *loc. cit.*

²⁶ *Mayo Clinic Bull.* 2: 57, 1921.

²⁷ *J. Am. M. Ass.* 88: 2027-2032, 1927.

²⁸ *Bost. M. and S. J.* 196: 845, 1927.

quency of the seizures but also improvement in health in children under twelve years of age on a diet in which the fat percentage was raised to over sixty per cent, the carbohydrate was restricted, and protein added to the extent of 1 gram per kilogram of body weight. We must, however, not forget that convulsions may occur even in the presence of pronounced ketosis, as in diabetic coma and in cyclic vomiting. Moreover, in time the system appears to react and the plasma bicarbonate gradually returns to normal, and the seizures may return.

Fasting as a method of checking the frequency of the seizures attracted much attention a few years ago, when numerous papers appeared detailing the good results obtained in a considerable percentage of cases treated. Those showing the greatest improvement were the ones with the highest excretion of acid. Unfortunately, with the termination of the fast the seizures recur. Lennox and Cobb report that in patients having frequent seizures and especially in children the beneficial effect of fasting is striking. Goldbloom²⁹ reports a case of frequent seizures which ceased during fasting, but recurred after it was stopped. It is doubtful, however, whether it is more effective than a high fat diet, which produces a similar degree of acidosis with less discomfort to the patient.

Alkalosis on the contrary has a definitely exciting influence on the nervous centres. Collier³⁰ in one of his addresses emphasizes this fact, and states that alkalosis may induce epileptic seizures, and that alkalosis, induced in a series of epileptics by hyperpnoea, will very promptly bring on seizures in the majority. However, in this over-ventilation of the lung it must be remembered that other factors enter, such as accelerated blood flow through the brain with decreased oxygenation of its cells, and a shift in the inorganic bases from blood to tissues, all tending to favour the development of convulsive attacks.

Blood Cholesterol. In a recent editorial in the *Lancet*³¹ attention is called to the behaviour of blood cholesterol in epilepsy. Investigations during and after seizures indicated that its amount in the blood was unduly low. Robinson, Brain and Kay³² reported in 1927 that cholesterol was lower in epileptics than in the controls, and in 10 cases out of 11 there was a definite fall before the seizure. In a paper published in the same issue of the *Lancet* as the editorial, Gordon, Fox and Brain not only confirmed the results obtained by previous investigators but also demonstrated a depression of the blood cholesterol during status and serial epilepsy and its instability in association with isolated fits, thus indicating the existence of a metabolic abnormality in epilepsy. A definite fact concerning cholesterol is its intimate relationship with the liver. It is secreted in the

bile, being presumably removed by the liver from the blood stream. The writer in the editorial states that these observations on the cholesterol content in epilepsy assume an added significance in the light of the investigation of the lævulose tolerance test in epileptics reported by Dr. Gosden and Dr. Tyler Fox³³. Their findings would appear to point to a severe functional liver deficiency, although as the writer remarks there is nothing in these observations to indicate a definite relationship between this disturbance and the attacks.

The Liver. Myerson, a number of years ago, observed that the weight of the liver was subnormal in a large proportion of autopsies on epileptics. This observation has since been confirmed by others. The writer in the editorial considers that there are sufficient indications to encourage energetic research into the hepatic functions of the epileptic.

SUMMARY

Lennox and Cobb in their summary of the more important advances in our knowledge of epilepsy, as brought out in their review, emphasize as one of the most important the demonstration that changes in the physico-chemical processes in the body,—and therefore also in the brain, such as anoxæmia, alkalosis and œdema, may profoundly modify the seizures in epilepsy. In any consideration of the abnormalities in the body outside the brain it is also important to recognize the inconstancy and abnormal variability in epileptics of almost all physiological processes. Variation appears to take place from day to day in the measurements of the hydrogen ion content in the blood, in the consumption of oxygen, in the blood sugar curves, in the activity of reflexes, in the stability of the sympathetic nervous system, in the excretion of ammonia, and in the nitrogen balance.

Because no constant structural lesions or abnormalities have been demonstrated in the brains or bodies of individuals subject to seizure, and because in the presence of very obvious lesions and abnormalities only a minority develop seizures, we must regard such abnormal conditions as playing only contributory rôles. The important problem still remains unsolved why, under a given stimulus, one individual should develop a seizure, and another show no sign of reaction. Further knowledge regarding the metabolism of nervous tissue and the relation which it may bear to its functions will greatly extend our understanding of the special conditions which contribute to seizures.

TREATMENT

Physicians must still regard an epileptic seizure as only a symptom, and should give full recognition to the many factors which may contribute to its occurrence. The golden opportunity to effect the greatest good is in the beginning, when the

29. *Canad. M. Ass. J.*, 12: 539-540, 1922.

30. *Lancet* 1: 1163, June 1, 1929.

31. 2: 27, July 6, 1929.

32. *Lancet*, August 13, 1927, 325.326.

33. *Lancet*, June 29, 1929. (Quoted in Editorial.)

detection and correction of an exciting cause may remove the symptom, and may effect a cure. Much assistance can be obtained in the early stages by a carefully evolved history. Recognition of the fact that changes in the physico-chemical processes in the brain cells and in the body tissues may profoundly modify the development of the seizures is most important. Lennox and Cobb consider oxygen lack as a *fundamental element* in the precipitation of seizures.

In some patients the careful use of sedative drugs may lessen the number of seizures, and at the present phenobarbital is recognized as one of the best. In the treatment of the status epilepticus, drainage of the spinal fluid, and the intravenous injection of 5 to 10 grains of luminal sodium is in Lennox and Cobb's opinion generally effective. Fasting may be of service at the outset, but the administration of butter, cream and emulsified oil may be early associated with it. Limited, and so called epileptic, diets have no justification, and may do more harm than good. Collier advises a normal life as much out of doors as possible. Education, pleasure and work should never be stopped, but never taken in excess. For those whose interests lead them to seek further into the nature of convulsions it may be stated that no subject of research necessitates such a broad outlook in its investigation, and such a close collaboration between the clinician, the physiologist, and the biochemist.

THE PREVENTION OF FILM FIRES*

By HARVEY AGNEW, M.D.

Department of Hospital Service, Canadian Medical Association, Toronto

PART II.

In recent years much attention has been focussed on the non-inflammable film, a film produced by coating the emulsion on a cellulose acetate base instead of on a base of cellulose nitrate. While this substance will burn, it does so slowly, without explosion, and with very little heat; it will not decompose like the nitrate base.

*Part I. appeared in the *Canad. M. Ass. J.* 21: 211; August, 1929.

Acetate films behave and may be stored like old paper. These films now cost about twenty per cent more than the nitrate films, a margin which is not likely to lessen greatly with increased demand, due to the fact that the essential factor is the greater cost of acetic acid. Gas production on combustion is as shown in the Table below.

Obviously the acetate film is much safer and its greater cost should not be a major consideration. There is still some difference of opinion on the advisability of regularly replacing the nitrate with the safety film. Poor safety films are often encountered. The smallest impurities seem to cause grain marks, blemishes, or uneven developing. There seems to be an increased tendency to curling, shrinkage, and brittleness; also, the stock must be turned over more rapidly because, as one manufacturer explained to the writer, there seems to be, in many instances, some chemical reaction between the base and the emulsion. One large general hospital and a well known tuberculosis sanatorium have protested against being required to use them. Our large hospitals are divided in their allegiance, although the majority have decided to use safety films. One operator thinks that the two types are of equal quality when the acetate films are good, but he occasionally gets a bad batch, which is naturally annoying. Other operators are quite pleased with the safety films. Undoubtedly their increased use will crystallize our opinion, and should stimulate the manufacturer to greater efforts to perfect their production.

D.F.P.A. RESOLUTIONS ON FILMS

Apropos of this controversy, the Dominion Fire Prevention Association, at their annual meeting, held in Ottawa in July, devoted one session to this subject. Canadian Medical Association representatives, including various radiologists, were present by invitation. The following resolution was passed:

"Having given consideration to the question of safety in hospitals, clinics, and other institutions, as affected by the use and storage of hazardous nitrate film, we, the Dominion Fire Prevention Association, do recommend that the provincial and local authorities having jurisdiction immediately enact legislation making it unlawful for any hospital, clinic, dispensary, school, college, asylum, or similar institution to have in or upon the premises any nitrate cellulose sheet film intended to be exposed to Roentgen or x-rays. Any such nitrate cellulose sheet

GAS PRODUCTION BY BURNING FILMS

TABLE
SAFETY FILM (acetate) INFLAMMABLE FILM (nitrate)

	SAFETY FILM (acetate)	INFLAMMABLE FILM (nitrate)
With abundance of air	CO ₂ (1.9768 gm. per litre)	H ₂ O CO ₂ Nitrogen (1.2507 gm.)
Little or no air	H ₂ O CO ₂ CO (1.2504 gm.) Acetic acid vapour	CO ₂ CO Nitric oxide (1.3402 gm.) Nitrogen dioxide (2.05 gm.) Nitrous oxide (1.977 gm.) Camphor vapour (very variable)

Hydrocyanic acid in minute quantities, and cyanogen (CN)₂ (2.337 gm.) have been noted as well as in film combustion. With the exception of carbon monoxide and nitrogen these gases are slightly heavier than air (1.228 gm. per litre), but the heat generated makes them rise under ordinary conditions.

film that may be already exposed, developed and stored upon such premises at the time this legislation becomes effective, to be stored in such place and manner as shall be prescribed and directed by the Fire Marshal or Fire Commissioner of the province."

Obviously the fundamental desire of the fire marshals was to help the hospitals to prevent fire and, from this viewpoint, this measure should prove timely and will undoubtedly meet with general approval. It has been thought that, considering the present uncertain quality of safety films, the objections raised by certain leading observers and the legal machinery whereby careful handling and storage could be enforced, a less rigid wording, providing a choice of film to those institutions observing special fire rules, might have been preferred. This recommendation will now be passed on to the Provinces for consideration. Storage of nitrate films at a distance from the main building is undoubtedly the safest procedure, although some provision may have to be made for certain city hospitals where only roof storage of valuable nitrate films is possible.

The Canadian Electrical Code has not yet been adopted by all of the provinces and this procedure was urged. Also, it has recommended that all public hospitals in their future construction be required to abide by the fire regulations dealing with the storage of x-ray film. Mr. Geo. Lewis,

the Deputy Fire Marshal for Ontario, recommended that all cellulose nitrate films be stencilled or marked in future as "Dangerous," or stamped "Nitrate" at least.

HOW TO BURN FILMS

At this conference, A. C. MacIntyre, Ph.D., the well known authority on explosives, urged that discarded films be burned, not thrown away, for they are a distinct menace to children and others. What is the best method of destroying films? He recommended that they be laid out in a long row in an open field and that the train be fired *against the wind*. Old films can be resold, of course, to the manufacturers. Dr. MacIntyre aptly remarked that if we were to think of the films as "gun-cotton" and the vault as a "magazine" we might be more careful.

* * * * *

One cannot refrain from considering the fire hazard due to the old x-ray films which collect in the average doctor's office and are so often piled on the radiator, frequently fall behind it, are shut up in a wooden drawer or lie on the desk beside his pipe and a half-corked can of ether. We all have been guilty. Truly, the Lord is kind!

REMOTE RESULTS IN GASTRECTOMY.—An investigation has been carried out at the Middlesex Hospital, London, into the remote results of gastrectomy by G. Gordon-Taylor, R. Faughan Hudson, E. C. Dodds, J. L. Warner and L. E. H. Whitby. The investigation was started in January, 1928, and consisted in a study of 52 patients, 14 females and 38 males. As far as possible those with malignant disease were excluded; two of the series, however, were found subsequently to be suffering from carcinoma. The operation of gastrectomy had been performed on all the patients in the series which was a consecutive one, starting in 1921 and finishing in 1926. The object of the investigation was twofold: first, to contrast the pre-operative and post-operative condition of the patient from as many points of view as possible, and, secondly, to determine what effect the removal of part or the whole of the stomach had upon the digestion, metabolism, intestinal flora and composition of the blood. The authors state that in the majority of partial gastrectomy operations one-third of the stomach is left and that in some instances more than this remains. The effect of the operation on the patient was estimated by his capacity for work after the operation. Those who could do full time work without fatigue, who could eat a normal diet and enjoy good health were designated 100 per cent efficient. Those who did part-time work only or who did whole-time light duty and who took a restricted diet were looked upon as 50 per cent efficient.

Of the 52 patients 40 had a pre-operative efficiency of nil, ten were 50 per cent and two were 80 per cent efficient. After operation two had an efficiency of nil, four were 50 per cent and 46 were 100 per cent efficient. Most of the patients had a good appetite and consumed ordinary meals at the usual intervals. Hydrochloric acid was found to be present in 20 per cent of the series. In 44 per cent definite anæmia was present. This was discovered only by laboratory examination and did not resemble pernicious anæmia. An increase in the blood-cholesterol and uric acid were the only abnormalities found on chemical examination of the blood. The amount of acid produced in each patient will be in a definite ratio to the amount of stomach excised. The good results following gastrectomy depend on three factors: a lower gastric acidity than normal, a less mobile stoma and a potential source for very rapid neutralization. In referring to the Polya modification of the Billroth II operation, the authors state that it has been abandoned because of recurrent ulceration. The cause of the ulceration was the fact that the blind loop of the jejunum had to depend for its protection upon the alkaline secretion of its own mucosa only, the ascent of the alkaline duodenal and jejunal contents being merely fortuitous. Both physicians and surgeons are trying to cure their patients by fundamentally similar methods; the routes which they follow are different.—*Brit. J. Surg.* April 1929.

Men and Books

THE LIFE AND WORK OF DR. GEORGE
A. KENNEDY*

BY THE LATE F. H. MEWBURN, M.D., F.A.C.S.

*Professor of Surgery, University of Alberta,
Edmonton*

Looking back over a period of forty-six years in this western country, it has been a matter of regret to me that no data had been collected by Manitoba of that galaxy of men that I found in Winnipeg in 1882 and onward; men headed by Lynch, Blanchard, Kerr, Brett, Good, Jones, Chown, Donnell, the two Fergusons, McDermid, Whitesides, and others; all good men and some brilliant. It has also been a matter of regret that nothing in that line was being undertaken in regard to our Alberta men, to whom we owe so much. So that when your invitation came to present the life of one of these men, I willingly complied, knowing my limitations, but trusting to your tender mercies.

In presenting to you to-night some phase in the life of the late George A. Kennedy of Macleod, I am calling your attention to a skilful medical man, a man of affairs, a fine type of citizen, a gentleman.

Kennedy was born on April 16th, 1858, in Dundas. He was brought up in that part of the country in which Osler roamed and worked at natural history. He graduated with the degree of M.B. from Toronto in 1878, as silver medallist, and one year under age. He was a hospital interne at Hamilton for six months, and then obtained his commission in the Mounted Police in the autumn of 1878. He came west by way of Salt Lake, Fort Benton, and then across country to Fort Macleod. He was then not yet twenty-one years old. He moved about the country from post to post, including Fort Walsh, Calgary, and back again to Macleod in 1884. In 1887 he left the Police and went into general practice. This was forty years ago.

Kennedy was instrumental in the formation of the North West Territories Medical Association in 1890, and delivered the first presidential address. He was at one time the Vice-president of the Canadian Medical Association. From 1897 till 1905 he filled the post of Inspector of Hospitals for the North West Territories. He was identified with the medical work on the construction of the Crows' Nest Pass Railway, and was Division Surgeon for the C. P. R. from the time that railway took over from the construction company till 1913. He was President of the College of Physicians and Surgeons of the

North West Territories from 1902 till 1907. In 1908 he was appointed to the Senate of the University of Alberta. He was elected to the General Medical Council of Canada in 1913.

Kennedy was one of the four men who toured the west, especially British Columbia, preaching and organizing the Western Medical Federation. The four were Brett, Kennedy, Milroy, and Patterson, the two last from Winnipeg. It was this move that made Ontario and Quebec drop their opposition to the Roddick Bill. The Bill passed, and the Dominion Medical Council of to-day is the result. You can see from this summary that my statement that Kennedy was a man of affairs is well substantiated.

In 1889—again let me draw your attention to the fact that it was nearly forty years ago—the Canadian Medical Association held a meeting in Banff. It was a large and successful meeting. There were a number of distinguished men from the United States as visitors, and Montreal and Toronto were especially well represented. Wheeler, of Cincinnati (the alternative man in case Osler refused Johns Hopkins), Connors, a well known bone and joint surgeon, Macey, of Boston, and others were among the visitors present at this meeting. It was then that Kennedy read a paper on the climate of Alberta and its relation to the cure of tuberculosis, and also touched upon the fever of the country. From this address, and one delivered a year later as President of the Alberta Medical Association, I will quote extensively, intending to show Kennedy's trend of thought, his lucid and clear expositions, his knowledge of the subject, his general knowledge of men and his high ideals.

The first paper produced a profound sensation in this meeting. The members of the Association, after leaving Winnipeg, had travelled through wild appearing, sparsely settled, country to the mountains. Such a paper, beautifully put together, well reasoned, coming from a comparatively young man living in the country, was unexpected and took them by storm. At that time overtures were made to him to return east and practice in Montreal, but he refused. He had the call of the west and he was faithful to that till his death which occurred in 1913.

Kennedy was much interested in the climate of Alberta and its application to the treatment and cure of tuberculosis, and also in the origin and real nature of the fever of the country that went by the name of "Mountain Fever."

In 1886 Kennedy made an attempt to have collected detailed reports of all cases of fever occurring throughout the North-west, and to study the special features of each district made better known. It was a matter of regret that his motives were misunderstood, and that his efforts were frustrated. He had been told that

* Read before the Calgary Medical Society, February 7, 1925.

hospitality and all that it meant. I know that from personal experience.

In conclusion, let me state that in those days before population began to roll in the lives of men were highly idealized. That ideal was compassed in the two words "White Man." Men were elevated to that class by their fellows, not by canvassing or electioneering but by their mode of ordinary every day life and all that went with it. Kennedy was one of these "White Men" of the country. He always lived up to it, never faltered, and never broke faith with his fellows. With his optimism, his imagination, his patriotism, his imperialism—imperialism in the wide sense of the term as a confederation of nations influencing the peace of the world—with all his work, Kennedy will take his place with those men who in the early and succeeding days, under stress and strain and many difficulties, laid the foundation, materially and intellectually, of the life we are enjoying to-day.

HUMPHRY DAVY, A GREAT NATURAL PHILOSOPHER

The centenary of the death of Sir Humphry Davy occurred last week. It will be commemorated at Penzance on Saturday.

Born at Penzance in 1778, Humphry Davy went to the local grammar school, read whatever came his way, was fond of telling stories and making verses, dabbled in mechanics and electricity under the guidance of a Quaker friend, but, fortunately, as he thought himself, was left much to himself and put upon no particular plan of study. He was little more than sixteen years old when he was apprenticed to Dr. Borlase, a surgeon in Penzance, and he atoned for any previous desultoriness in his education by drawing up a most ambitious scheme of self-instruction in preparation for the profession he had chosen. It was at this time that he accidentally made the acquaintance of Davies Gilbert, always his very good friend and afterwards his successor as President of the Royal Society, who, it is said, saw him swinging on the half-gate of Dr. Borlase's house and entered into conversation with him. Through Gilbert he got not only the run of a laboratory belonging to Dr. Edwards, of Hayle, but also an introduction to Dr. Thomas Beddoes, who gave him his first professional appointment.

During the latter part of the 18th century great progress was made in the discovery, or identification, of gases, both elementary and compound, and not for the only time physics found in the advances of physical science the hope of useful additions to its armamentarium. Beddoes was one of those who thought that "factitious airs" would prove valuable as medicinal agents, and in pursuance of this idea he established his Pneumatic Institution at Bristol. Davy, then barely twenty years of age, was engaged to superintend the experiments, and was thus put in command of a chemical laboratory.

Among the experiments Davy made at Bristol the best known are those on laughing gas (nitrous oxide). He records that on one occasion, after breathing sixteen quarts of it for nearly seven minutes, he was absolutely intoxicated and danced like a madman. Thereafter the inhalation of the gas seems to have become something of a fashionable amusement. Davy's work at Bristol had brought him into prominence, and the result was that Count Rumford, needing a chemical lecturer for his new Royal Institution, secured him for the post, at a salary of 100 guineas a year, with a bed-sitting room in the house and coals and candles found. He entered upon his duties in 1801, and the dozen years he spent at Albemarle Street were undoubtedly the most fruitful period of his life. The voltaic battery, invented a year or so before, had come, in his own words, as "an alarm bell to experimenters in every part of Europe," and no one made a more brilliant use of the new instrument than he did. His preparation of metallic potassium and sodium in 1807 by the electrolytic decomposition of potash and soda was, perhaps, the most spectacular result he obtained with its aid, but the Bakerian Lecture on "Some Chemical Agencies of Electricity," which he delivered before the Royal Society in the previous year, represents achievements of far greater intrinsic importance.

Throughout the time he spent at the Royal Institution, during which he made many other notable discoveries, and some mistakes, he proved an extraordinary success as a lecturer. He was able to make science a fashion and the Institution a vogue. But in 1812 there came a change. Within the space of a week he was knighted, gave his farewell lecture (though he remained as Professor of Chemistry without the obligation to lecture), and married a rich widow, Mrs. Apreece, a distant cousin of Sir Walter Scott.

After his marriage he wrote his "Elements of Chemical Philosophy," which like others of his works bears the marks of hasty composition under the spur of his love of glory, damaged an eye by an explosion of chloride of nitrogen, and departed with his wife on a long continental tour through France, Italy, Switzerland and Germany. At Paris he was fêted by the galaxy of men of science then resident in the French capital, and with the aid of his portable chemical cabinet—the Chemical Philosopher in "Conversations in Travel" remarks a little naively that some of the best and most refined researches of modern chemists have been made by means of an apparatus which might with ease be carried in a small travelling carriage—put them right about the nature of iodine, which one of them had recently discovered; at Genoa he made experiments on the electric ray or torpedo; at Florence he burnt diamond by the sun's rays concentrated through the great burning glass at the Accademia del Cimento and proved it to consist of carbon; he made several ascents of Vesuvius; he met Volta, who, himself arrayed in full Court uniform in honour of the occasion, was aghast at the

careless dress of the distinguished visitor; and at Geneva he investigated the heat of the infra-red rays of the spectrum. Throughout the tour Faraday formed one of the party.

Soon after his return to London in 1815 Davy busied himself with one of his most notable contributions to the quantity of human happiness—the miner's safety lamp—and the assiduity with which he laboured at this task is attested by the large collection of models preserved by the Royal Institution. In recognition of his work the Northumberland coalmasters subscribed to present him with a silver dinner service, which, under his will, ultimately passed to the Royal Society and was melted down and sold, the interest on the proceeds providing the annual Davy medal. In 1818, the year in which he was made a baronet, he again went to Italy and worked at unrolling papyri from Herculaneum. Returning to England in 1820, he was elected President of the Royal Society, although his

predecessor, Sir Joseph Banks, had thought him rather too lively for that august position. In that capacity he took an important part in founding the Athenaeum, and it was to him that Croker, to whom the idea of the club was due, first definitely proposed his plan.

Later his health began to fail. After a slight paralytic stroke he was ordered abroad early in 1827, but returned to London in the autumn and occupied the winter in composing "*Salmonia, or Days of Flyfishing*," which is obviously modelled on "*The Compleat Angler*." In the spring of the following year he again went abroad, and spent the winter in Rome, where, a "ruin amongst ruins," he wrote "*Consolations in Travel*," containing, as he said, the essence of his philosophical opinions and some of his poetical reveries. In February, 1829, he had another stroke, but under the care of his brother, Dr. John Davy, rallied sufficiently to be moved to Geneva, only to die immediately after his arrival.—*The Weekly Times*, June 6, 1929.

Hospital Service Department Notes

CAN STAFF MEETINGS BE MADE ATTRACTIVE?

PREPARED BY THE DEPARTMENT OF HOSPITAL SERVICE OF THE CANADIAN MEDICAL ASSOCIATION

This is approaching the time of year when the flaming hues of Indian summer bid us turn back reluctantly to the more serious interests of life. Perhaps, as medical men, we should refer to this season as St. Luke's summer. Again our thoughts revert to the many clinical problems which were left unsolved last spring, and which are to be attacked with renewed vigour this autumn. Hospital staff secretaries are judging the optimum time to call the first "free-for-all" on the subjects of "When is a peptic ulcer surgical?" or "Will diathermy help pneumonia?"

Why are some staff meetings absorbingly interesting while others are so dull that they are attended only when all excuses have been exhausted? Why are some hospital staffs so keenly alert and progressive, while others "drift gently down the tides of sleep," without cohesion or co-operation, many of their members still using the methods generally abandoned many years ago? Yet one can hardly blame busy delinquents for "forgetting" meetings which have no definite program, never start on time, are dry and uninteresting, and seldom manifest the social possibilities of such gatherings. This is unfortunate, for a proper staff organization is absolutely essential if a hospital is to give the most efficient service to the public. Moreover, such organization enables us to pool our experience and know-

ledge, crystallize our opinions, and simplify our diagnostic problems. The New Year's message of the President of a great Canadian university to his students to "clarify your ideas by discussion" is a timely one, worthy of the consideration of every medical graduate.

WHY INTEREST LAGS

For some time now, the writer has had the privilege of attending hospital staff meetings in various parts of Canada. These visits have afforded an unusual opportunity to compare types of meetings and to observe what methods have been found by actual experience to be productive of most interest and enthusiasm.

The type of program is of fundamental importance. All too often, it is somewhat soporific. The review of the deaths for the week, or the month, is a most desirable feature, but the list should not be hurriedly recited to a yawning audience who are either not interested or who follow the list with knowing nudges or winks at the expense of the doctors mentioned. Nor should this rendition be followed by the customary period of silence, not maintained out of respect for the dead, but due in part to the usual absence of the doctors concerned, or partly to the fear that some question or remark may be construed as malicious by the sensitive doctor in charge of the case. There seems to be a general impression that the doctor must defend himself, must submit to cross-questioning and be asked about basal metabolisms, concentration factors, platelet counts, and other studies often of questionable value in the case concerned.

IMPROVING THE PROGRAM

The study of the mortality lists can be made of unusual interest if the discussion be centred on those cases which illustrate *interesting symptoms, diagnostic signs and complications, or about which the therapeutic procedure is debatable*. If differences of opinion be kept upon a friendly and respectful plane, controversial points can be argued and debated to the intense enjoyment of all present. If clinical judgment is to progress, personalities must be forgotten, and all individuals become "pachyderms" in the interest of science. A heavy responsibility is laid upon the chairman, for he is the helmsman who must guide this craft between the shoals. Many staffs leave all suggestions of incompetence, faulty judgment, unethical or unwarranted procedures, etc., to a special committee of senior members or heads of services, rather than have such unpleasant matters aired in a general meeting. Certainly, any difference of opinion arising in a staff meeting should never be quoted outside of the staff meeting, or used in any unfair manner to embarrass the individual concerned.

The staffs of *small hospitals* located in rural communities often find difficulty in studying actual cases, either *ante mortem* or *post mortem*, for various and obvious reasons. A number of such small staffs have solved their difficulty by devoting a part or all of certain programs to the study of borderline or cultural subjects. Historical medicine is a most fascinating study, and the ferretting out of information concerning the local medical pioneers would provide exceedingly valuable data for our recently formed Section of Historical Medicine. A demonstration of biological specimens, travel talks, an evening with the philosophers or with the stars, would provide excellent diversion to supplement the usual clinical program.

A number of clinical societies have found it helpful to appoint a program committee to arrange the meetings. Various members are warned to be prepared to lead the discussion on various subjects. Doctors are encouraged to show interesting or problem patients from their outside practice. Practical experience has proved that most private patients are more than willing to go to the hospital for such a purpose. Many are glad to get the free consultation. Such "outside" patients should never be kept waiting.

"AND NOW, FORSOOTH, TO THE BREAD, THE
CHEESE AND THE BEER!"

If one single factor can break down suspicion and jealousy and introduce a new era of co-operation and *esprit de corps*, it is the staff luncheon. There is nothing like a bowl of soup or a search for the cheese knife to break down the last barrier between confrères. Some hospital staffs prefer a noon luncheon, others, a dinner in the evening; with some, a late supper following the meeting is favoured. A few staffs hold their clinical meeting before the luncheon and listen to music or a guest

speaker after they have dined. The speaker may be a visiting physician or an outstanding layman.

One of the problems of many hospitals is to gain closer co-operation in viewpoint and interest between the medical staff and the board of trustees. Again the festive board has come to the rescue in several institutions. Joint luncheons of the two bodies, held two or three times a year, should be a feature of the program of every clinical society. Also, where two hospitals with separate staffs are in the same or adjoining towns, entertainment of one staff by the other should be encouraged.

If the hospital has adequate accommodation, meetings should be held there, to facilitate clinical study, but frequently the local hotel must be chosen, especially for luncheon meetings. Guest speakers from medical centres help to broaden the medical viewpoint, but the local staff should be encouraged to participate as much as possible. The more interesting of these case reports and comments could be recorded in the provincial Bulletin or the *Journal* of the Canadian Medical Association. It is preferred, as a rule, that more formal papers or essays be read at a meeting of the local County Society rather than at a hospital staff meeting.

SELECTION OF OFFICERS

It is important that officers be carefully chosen. They should be selected not necessarily upon a basis of seniority, but because of their interest in staff welfare, their tact, and their influence with their colleagues. The presidency should rotate at frequent intervals among the more active senior men, but it is too vital a post to be entrusted to one who does not appreciate its responsibilities. This office should be quite separate and distinct from any clinical appointment, and should not entitle its incumbent to any clinical authority beyond his usual staff seniority. Where an associate, or courtesy, staff exists, the presidency is limited, as a rule, to active or full staff members.

The secretary and the members of the program committee are frequently chosen from among the younger members who still have sufficient time to implement their visions and ideals with time-consuming executive service. The personnel of other committees should be so chosen and rotated so as to give practically every member, especially the delinquents, some duty. A constitution supplementing the regular staff rules and regulations is usually adopted, in order to define the scope of this clinical society, which is within but distinct from the duly appointed hospital staff.

SHOULD ATTENDANCE BE COMPULSORY?

Various measures have been adopted to ensure attendance. Some hospitals drop a doctor from the staff if he is absent a certain number of times without just cause. Others post the names of delinquents (attendance, fees, or both) on the bulletin board. However, harsh measures result in but half-victories and a wiser procedure is to make the meetings so interesting and so valuable

that no member will even think of missing a single session. Notices and programs can be sent out by the hospital stenographer. Doctors, whose cases are to be discussed, should be notified by letter several days in advance and reminded by telephone on the previous day, or that morning, if it is to be an evening meeting. A few hospitals make it obligatory that each member of the active staff prepare at least one paper or report each year.

Finally, one should bear in mind the interest which can be aroused by that spring and fall hospital golf tournament, with the dubious handicaps, and the gay dinner when the prizes are distributed and the battle retold in movies; the bridge and dance, when the wives get acquainted; and the bowling tournament where years prove no handicap "There are more ways than one to kill a cat" or to revive a staff which is "full of a sweet indifference."

HARVEY AGNEW

ADDING NEW LIFE TO SURGICAL TOOLS BY PLATING WITH CHROMIUM

The process of applying chromium in plate form to other metals was developed only a few years ago to the point where it could be used with commercial success. Manufacturers of numerous varied products quickly adopted it to give added beauty and durability to their products. Little was it realized at this time, however, that chromium plating would come to mean so much to the hospital and its surgeons in preserving surgical instruments in proper condition.

Typical products, in addition to surgical instru-

ments, that are plated with chromium to-day are plumbing fixtures, bathroom and kitchen fittings, printing rolls, stainless steel, hinges, door knobs, golf club heads, automobile head lights, radiators, bumpers, crankshaft bearings, piston pins and other parts, marine hardware and fittings, and even cigar lighters, belt buckles and vanity cases. Other examples are parts of manufacturing machinery receiving tremendous wear and used in the oil, textile, rubber, tool and other industries. An interesting use is for the reflectors in acetylene lamps, which are soon dimmed by fumes unless they are chromium plated.

The wide diversity of chromium plated products reveals the reason why this lustrous surface covering is widely preferred. In the first place it makes a beautiful finish, and one that requires no polishing, but simply wiping. In the second place, chromium plating provides a durable and impervious metal surface. It ranks next to the diamond in hardness. It does not tarnish or stain. It is nine times as hard as nickel, five times as hard as the best steel. It does not peel, chip, check or blister and is not affected by sterilizing solutions or heat up to 600° F. It melts only at 2,700° F. It is not affected by organic acids, and by only two mineral acids, hydrochloric and sulphuric, by the latter but slightly.

Many hospitals have tried the experiment of having old surgical instruments reconditioned and chromium plated. (*Modern Hospital*.)

Note.—In the purchase of certain plated surgical instruments subject to considerable hard usage, such as scissors, forceps, etc., hospitals would be well advised to specify "chromium plated." This is worth the slight additional cost and, for many instruments, no additional charge is made. [Ed.]

Medical Societies

NEW BRUNSWICK MEDICAL SOCIETY

The New Brunswick Medical Society held its annual meeting in Saint John, July 16th and 17th. The attendance was larger than usual and the business of the Society was of more than usual interest.

The matter of a new schedule of fees and ethics was in the hands of a committee during the past year. This committee was composed of: Drs. V. Davidson, Chairman; A. S. Kirkland and R. M. Pendrigh. The schedule of fees, as recommended by this committee, was adopted after a great deal of discussion. The chief opposition to the fee list developed among the country practitioners, who declared that it was impossible to maintain fees which were justified in urban practice. This stand was concurred in by some of the city practitioners. In the discussion, it was advised that any cases where the fee had to be cut to meet the circumstances of the patient it would be advisable to bill the client for the full amount, and, if necessary, to reduce the fee.

This would show the patient the amount of services he was receiving, and would be a deterrent to actual fee-splitting.

The second matter of general interest was the submission of a new scale of fees arranged between the Society and the Compensation Board. The matter had also been handled by a special committee composed of Drs. J. M. Barry, A. S. Kirkland and V. D. Davidson. The new schedule of fees, it is felt, will, on the whole, be satisfactory. As nearly as possible a fixed fee for a certain injury has been adopted, the sliding scale of fees, previously in force, having been done away with. The fees for major work have, in most cases, been increased. The debate centred about the amount chargeable for minor surgery. This type of work has been a standing source of friction in the past, and has lent itself to abuse in the hands of some men, necessitating arbitrary taxing of bills by the Board. The new schedule was finally accepted in this connection. The committee which negotiated the schedule was

appointed a buffer committee for the next year. All disagreements between the physician and the Board are to be handled by this committee. It developed in the negotiations that the Compensation Board were most reasonable and willing to meet the physician's viewpoint wherever possible.

Another item of interest was a prolonged discussion *re* the possibility of appointing a full-time secretary. It was felt that, at present, even with the generous aid offered by the Canadian Medical Association, it would be impossible to finance such a secretary.

The scientific program presented several papers of general interest.

Dr. Eugène St. Jacques, Montreal University, read a paper on "Splénomégalies," which was extremely interesting and brought out a discussion, chiefly by Dr. G. A. B. Addy, who presented several cases of his own. Dr. R. R. MacGregor, of Queen's University, presented a paper on "Infantile nutritional disturbances." This paper had a direct appeal to the general practitioner, and Dr. MacGregor's initial appearance in New Brunswick provided a delightful contact with many new friends here. Dr. Norman S. Shenstone, of Toronto, summarized and discussed the old and new methods of "The treatment of empyema." Dr. Grant Fleming, McGill University, presented a moving picture demonstration of a periodic health examination.

The thanks of the Society were expressed to all these gentlemen from outside who materially assisted in making the meeting a success.

Papers by local speakers included one by Dr. Mabel Hannington regarding the mentally defective, and one by Dr. E. J. Ryan on the treatment of gonorrhoea.

The Saint John Medical Society entertained the visitors from outside the city at a dinner on the first day of the meeting. The Chairman of the local society, Dr. A. S. Kirkland, presided.

The election of officers for 1930 resulted as follows:—

President, Dr. A. S. Kirkland, Saint John; *Vice-President*, Dr. R. W. Earle, Perth; *Second Vice-President*, Dr. Alex. Bell, Newcastle; *Treasurer*, Dr. V. D. Davidson, Saint John; *Secretary*, Dr. J. R. Nugent, Saint John; *Additional Members of the Executive*, Dr. R. M. Pendrigh, Saint John; Dr. J. A. MacNaughton, Moncton; Dr. B. Robertson, Keswick Ridge; Dr. P. Laporte and Dr. C. J. Veniot, Bathurst; *Additional Members to the Executive of the Canadian Medical Association*, Dr. G. Clowes Van Wart, Dr. W. F. Roberts, Dr. L. G. Pinault, Dr. D. C. Malcolm.

As a place of meeting for 1930 St. Andrews was chosen. The 1930 meeting will be the 50th Anniversary of the New Brunswick Medical Society. At this meeting it is hoped to entertain as guests the Medical Society of the State of Maine and visitors from Nova Scotia and Prince Edward Island.

A. STANLEY KIRKLAND.

University Notes

Aberdeen University

At the summer graduation at the University of Aberdeen on July 3rd, when a number of medical and other degrees were conferred, Principal Sir George Adam Smith commented on certain features of the past session. The total number of matriculated students was 1,385. The figure for men students had risen by 33, but there were 41 fewer women students. In the Faculty of Medicine there were increases in respect of both sexes; the total of 294 (263 men and 31 women) contrasted with 233 in 1927-28. The year had witnessed several notable additions to the medical and scientific resources of the city, with all of which the University was more or less associated. The new Hospital for Sick Children had been completed and opened upon its portion of the ample site acquired for the great Aberdeen Joint Hospitals scheme. The Principal added that it was fitting that they should congratulate Lord Provost Lewis on the success of his endeavour to raise £400,000 for the new Royal Infirmary, as well as on the honour recently

conferred upon him by the King. In close connection with the Rowett Institute for Research in Animal Nutrition, an Imperial Bureau was being founded which would be the centre for recording and classifying researches in that subject and their results throughout the British Empire. Again, in addition to the Aberdeen Laboratory of the Scottish Fishery Board, the National Department of Scientific and Industrial Research was to open another laboratory, which would enlist the co-operation of different University departments such as that of bacteriology; it was confidently hoped that this new development would be of benefit to the science of ichthyology as well as to the fishing industry of the country. Lastly, the Scottish Department of Agriculture had arranged to establish in Aberdeen an institute of soil research; this would be named the Macaulay Research Institute in recognition of the munificence of the distinguished Canadian, a native of Aberdeenshire, who had rendered its establishment possible. In all of these directions Aberdeen and the North of Scotland were to be

congratulated upon the increase of their scientific and educational facilities.

University of Melbourne

Professor Frederic Wood James, D.Sc., M.B., F.R.S., has accepted the invitation of the council

of the University of Melbourne to the Chair of Anatomy, in succession to Professor R. J. A. Berry. He will take up his duties in March, 1930. Professor Wood Jones held the Chair of Anatomy at the University of Adelaide from 1919 to 1926, when he was appointed to the Rockefeller Professorship of Physical Anthropology in the University of Hawaii, Honolulu.

Topics of Current Interest

THE THERAPEUTIC USE OF CARBON DIOXIDE

By G. HARVEY AGNEW, M.D.,

*Hospital Service Department,
Canadian Medical Association,
Toronto*

Although carbon dioxide is one of the most familiar of our chemical substances and its properties are known to every medical student, the therapeutic application of these properties has not been as general as one might have anticipated. Everyone knows that carbon dioxide is an unusually powerful stimulant to the respiratory centre, but its use in actual practice as a respiratory stimulant is not widely recognized. This observation has been impressed upon us while visiting hospitals throughout the various parts of Canada.

Some ten years have passed since Henderson, Haggard and Cobourn¹ recommended the use of 5 per cent carbon dioxide in oxygen as a respiratory stimulant in anaesthesia. It had been recommended in 1912 by MacCurdy² as a means of increasing the blood pressure during the shock of operation, but Henderson and his co-workers considered carbon dioxide from another physiological viewpoint, namely, its ability to increase the depth and frequency of the respiratory rate. Since that date, it has been used in many hospitals in Canada and the United States, either as 5 per cent carbon dioxide in oxygen, a mixture which can be readily obtained from various supply houses, or in the pure state in cylinders which can be suspended from the yoke of the anaesthesia machine and the gas then mixed with oxygen, nitrous oxide, or ethylene as desired by the anaesthetist.

The following advantages have been demonstrated repeatedly:—

1. Breath-holding, shallow breathing, and resultant cyanosis have been eliminated.
2. There is an increase in the rate of ether absorption.
3. The sedative effect of morphia can be

obtained without the depression of the respiratory centre which so often accompanies morphia administration.

4. There is a lower concentration of ether vapour.

5. In light anaesthesia, there seems to be greater relaxation.

6. Induction is more pleasant to the patient.

7. The patient can be readily de-etherized and revival hastened.

ITS USE IN OBSTETRICS

Carbon dioxide in oxygen has proved very helpful in the resuscitation of the new-born. It is much more certain in its effect than some of the methods of artificial respiration now taught to obstetrical students. One Canadian hospital, which recently installed this mixture of gases in its obstetrical department, reports that three infants who would most certainly have died without this therapeutic aid were stimulated thereby to natural respiratory movements and their lives saved. With infants, it is customary to introduce the carbon dioxide in oxygen either through an oral catheter or with a mask. Simultaneously, gentle artificial respiration is practised to draw the carbon dioxide into the infant's lungs. As soon as natural respiration has started, the mixture is withdrawn. Owing to the delicate nature of the lung tissue, care must be exercised that the gas pressure be very low. Recently it has been recommended that carbon dioxide in oxygen be administered to the mother just as the head comes over the perineum. Breath-holding is thus minimized and the accoucheur finds it less difficult to save the perineum.

This mixture has proved of value also in carbon monoxide poisoning, freeing the blood of the poisonous carboxy-haemoglobin by increased lung ventilation; and it has been used with excellent results in severe morphia poisoning where the respiratory depression is very marked.

Some hospitals purchase 5 per cent carbon dioxide in oxygen in large cylinders under high pressure and use a reducing valve to lower the pressure sufficiently to permit administration. It is well to build the gas

through a bottle suspended from the side of the tank, so that the rate at which the gas passes through the nasal catheter can be noted. Where a tank of the pure carbon dioxide is suspended from the nitrous oxide machine, it is well to remember that 5 per cent of carbon dioxide in any anæsthetic vapour should be the maximum concentration.

While carbon dioxide is considered to be harmless in low concentrations, it is not entirely free of certain dangers if concentrated. When given an overdose, there is a tendency for the patient to cough. There may be even holding of the breath and ultimately collapse. Writing in *The Journal* over a year ago, Waters³ pointed out the possibility of carbon dioxide disturbing the acid-base balance; this might explain some of the symptoms of over-dosage. However, it is far less dangerous than chloroform, ether, or other anæsthetic vapours and, if handled with reasonable care, should save many lives and prove a valuable aid to the anæsthetist, surgeon and obstetrician.

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2. MACCURDY, J. R., *Modern Hospital*, 1912.
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RAYON AND IRRADIATION

Originally man made his textiles from such animal and plant fibres as he found; then he began growing cotton and flax, silkworms and sheep; soon he will make his fabrics chemically. The astonishingly rapid growth of the rayon industry indicates that the world is already far along toward synthetic clothing. In a recent account* it is shown that, whereas ten year ago 9,000,000 pounds of rayon was made in this country, the production for 1928 was almost 97,000,000 pounds. The raw material is wood pulp which, after treatment to loosen the fibres and to remove the lignin, is finally obtained as a solution of cellulose nitrate, acetate or the cuprammonium compound and forced through tiny apertures to form threads. The fabric made from this thread has been found well adapted to use in many garments and has already become well established in the textile trade. Rayon is similar to silk in appearance and is cool and nonabsorbent. Spun rayon has been used with cotton and wool and even to replace the latter in many fabrics. A small change in the process results in a kinky fibre similar to wool and at times difficult to distinguish from it. A hollow filament rayon has

been produced, the contained gas of which increases the resemblance to silk, while filaments of great strength and elasticity are about to be introduced as rayon sewing thread. Rayon can be dyed satisfactorily, and the possibility of improvement from further research indicates that the industry has the prospect of indefinite life. Of unique physiological interest is the observation of Dozier and Morgan† that ultra-violet rays penetrate rayon better than certain widely used cotton and silk fabrics studied. This effect depends not only on the interspaces of the cloth but also on the quality of the fibre itself. On the other hand, measurements by Coblentz of the Bureau of Standards indicate that the mesh and thickness of the material are primarily concerned in transmission of ultra-violet rays. The certain method of dosage is the application of the rays directly to the skin. —*J. Am. M. Ass.* 92: 2175, June 29, 1929.

† Dozier, C. C., and Morgan H., *Am. J. Physiol.* 84: 603, April, 1928; 86: 32, 1928.

MEDICINE IN SOVIET RUSSIA

Dr. Ralph A. Reynolds, retired president of the American Medical Association of Vienna, on his return from Soviet Russia told the *New York Herald Tribune* that he had visited a large number of clinics in Moscow and Leningrad. Under the socialist system every worker is insured, and when he gets ill the insurance not only pays the full wage during the time of disablement but also the hospital expense.

An institution which has no parallel abroad is the night sanatorium for workers who are in a poor physical condition. These workers, instead of going home when their working hours are over, pass the remainder of the day and the night in the sanatorium. They get a shower and are put to bed for an hour, then do physical culture exercises after which they may occupy themselves as they like until bedtime, which is fixed at an early hour. They are also served a special diet. Only on Sundays are they allowed to leave for their homes. Such a "cure" generally lasts two months. In Moscow there are twenty-four night sanatoria, ten of which are for tuberculosis suspects.

There are 156 day nurseries in Moscow alone, each of them near a big factory. The average attendance is 125 children. To instil the spirit of sovietism at an early age pictures of Lenin as a babe decorate the walls.

The medical service is public. Everybody is entitled to free treatment. About 140 physicians are on duty at a Moscow clinic, and from thirty to forty doctors are detailed to at-home service during the night hours. As private practice is abolished anyone taken ill or meeting with an accident during the night telephones to the nearest clinic and is taken care of.

Village clinics have been distributed so that

* Ginsberg, I., *J. Indust. & Engin. Chem.*, news ed., May 10, 1929, p. 6.

each clinic serves a population of 15,000. In the more sparsely populated districts this means that many people are more than fifty miles from a doctor. It is difficult to win the uncultured peasant class to modern ideas of hygiene; conditions in the open country are still appalling.

The Russian Government spends money lavishly on modern instruments and other equipment. Funds are always available for research work and propaganda, but the salaries of doctors are small and cannot compare with what a professor or a practitioner can earn in other countries. Physicians of high standing get about a hundred dollars a month and have to be contented with a miserable home of one or three rooms with a kitchen that is often shared by as many as six families. The idea is that a doctor's home should not be so good as the class of homes given to Communist skilled workers who form the aristocratic class in the Soviet Republic.

As the prospects for the medical students are totally different from what they once were, the class of people who go in for medical studies has undergone considerable change. Only those who support the Soviets enter the medical career. Women students, who, before the war, were 34 per cent are now 55 per cent of those studying medicine. Ninety-seven per cent of all medical students are educated by the government. In return they must go where the government sends them when they have completed their studies. For many this means exile in some out of the way place with great hardships. After having served three years on the post assigned to them they are free to make a choice of their own. They can shorten this three-year period if they accomplish something outstanding. Medical studies take five years in medical school and one year in hospital.

Russian doctors follow the progress of medicine in other countries closely and take over all improvements, but their own scientific research leaves much to be desired. Dr. Reynolds had the impression that the Bolshevik system is becoming firmly entrenched, and that the rulers of Russia have the country well in hand.

LILLIAN A. CHASE

IODINE AND GOITRE

The view that a deficiency of iodine in the diet is the chief factor in the etiology of simple thyroid enlargement has become well established by repeated demonstrations of prophylaxis and cures, both in experimental animals and in man. Although attention was definitely fixed on the rôle of iodine by Baumann's discovery in 1895 that this element occurs in the thyroid gland in organic combination, iodine-containing materials such as sea salt and the ashes of sponges and of sea weeds are ancient remedies for simple goitre. Through the combined efforts of various investigators both in this country and abroad, a series of

apparently dissimilar diseases has been related to a deficiency of iodine in the food, which, in turn, can be correlated with the paucity of this element in the rocks and soil of the locality in question. As might be expected, then, simple goitre in man is, to a striking extent, regional in occurrence, certain places, such as the eastern sea coast, being comparatively free from the disease, while other localities, such as the Great Lakes basin, are known for the high incidence of thyroid enlargement.

The mode of action of iodine in the organism is not entirely clear. The minute quantity of this substance involved in the metabolism of the thyroid has made analytic procedures difficult to carry out. However, through the combining of known facts of goitre incidence with such metabolic studies as are possible, knowledge of significance has been obtained. Investigations of this nature have been recently reported by Lunde* in Oslo. He points out that, contrary to statements that have appeared in the literature, endemic goitre can be found in certain regions in Norway, a sea-swept country where one would least expect it. Proceeding on the principle that, in a person in iodine equilibrium, the output of iodine in the urine is an index of the amount of iodine absorbed, he investigated the excretion of iodine in a considerable number of men. They were chosen from districts in which goitre was prevalent but did not themselves have enlarged thyroid glands. The concentration of iodine in the urine was found to be influenced markedly by the use of sea fish in the dietary. When the persons studied were given a controlled diet not containing fish, the analyses showed that there was an inverse proportion between the incidence of goitre in the youth of the region and the concentration of urinary iodine of nongoitrous individuals of that locality. The average iodine output in the urine was 0.040 mg. in twenty-four hours in a district showing a goitre incidence of 59.7 per cent, while in a region free from goitre the iodine excretion was 0.173 mg. Similar studies conducted in Switzerland have given parallel results.

Since the relative concentration of iodine in the urine is an index of the level of body metabolism of this element, the correlations cited serve to emphasize again the essential dependence of the thyroid gland on iodine for its normal activity. A prolonged deficiency of this substance may from experience be expected to result in a hyperplasia of the gland. The minute traces in the food and water, as well as the small concentrations in the urine, indicate that the absolute requirement of the body for iodine is exceedingly small. Indeed, from this fact has developed the now well founded dictum of the importance of little things in the diet, one of the fundamental tenets of the modern position on nutrition.—*J. Am. M. Ass.* 92: June 29, 1929.

* G. Lunde, *Biochem. Ztschr.* 193: 94, 1928.

THE PUBLIC AND MEDICAL CONVENTIONS

An "experience meeting" of medical men ought to be of first class value to the public. The laymen may not understand everything or even much of what is said. But the medical men do, and they translate what they learn from the experiments and the experiences of others into practical helpfulness in the sick-rooms of their patients.

It is too often said that physicians know little or nothing about this or that ailment. The best physicians are the first to admit the serious limitations of their knowledge. But they do know infinitely more than the sufferer or his family, even if it be only a thorough knowledge of the physical frame which has been thrown out of joint.

Physicians should be regarded—not as all-wise augurs or mystic miracle-workers who can banish disease by invoking an incantation or a drug—but as soldiers fighting for health, fighting hand-to-hand battles in the humble home or about the hospital cot for the lives of the stricken. To say of a doctor that he is a real force on the side of life in his community is to say the most that can be said of him, and is to say a very great thing.

Probably no professional men work harder or longer to acquire new knowledge than physicians. They are always at school. They are always exchanging discoveries, if not at conventions then through professional journals. The happy "hit" of one doctor becomes at once public property available to the hand of every colleague. They do not patent their inventions and mint the sufferings of mankind into cash. They are sentinels always on the watch and always eager to sound the alarm when a foe approaches or when an enemy can be beaten back.

Thus a medical convention is of greater interest to the community at large than a gathering of any other class of worker. They do not meet to create monopolies but to assemble free gifts for the world at large. A cancer discovery in Vienna—if it be true—increases the expectation of life in Saskatchewan, in the Malay States, in every land under the sun. The reports of these conventions in the popular Press, couched in language understood of the plain people, are of real and widespread educational value. To popularize medical knowledge is a public service. Nothing interests the average man so much as his health, and to be able to read what the best doctors in the world are saying about the particular malady that menaces him is a priceless boon. Yet these reports could not be printed if the medical men did not meet in open conference and discuss their difficulties as well as their achievements within the hearing of humanity as a whole.—Editorial: *Montreal Star*.

SENATOR SMOOT HITS CIGARETTE CAMPAIGNS

Taking exception to advertising campaigns to promote the use of cigarettes, Senator Smoot, of Utah, offered in the Senate to-day a resolution to include tobacco and tobacco products within the scope of the food and drugs act.

His resolution also would amend the food and drugs act so that claims made for food and drug products in any advertising medium subject to Interstate Commerce Commission control should be under the same regulation as is applied to labels on containers. Senator Smoot, whose State produces large quantities of sugar, denounced the effort of cigarette manufacturers to divert users of sweets to cigarettes.

"Not since the days when public opinion rose in its might and smote the dangerous drug traffic," said Mr. Smoot, "not since the days when the vendor of harmful nostrums was swept from our streets, has this country witnessed such an orgy of buncombe, quackery and downright falsehood and fraud as now marks the current campaign promoted by certain cigarette manufacturers to create a vast woman and child market for the use of their product."

Mr. Smoot said he was not questioning the use of tobacco by adults.

"I rise," he said, "to denounce the insidious cigarette campaigns now being promoted by those tobacco interests whose only god is profit, whose only bible is the balance sheet, whose only principle is greed."

"I denounce the unconscionable, heartless and destructive attempts to exploit the women and youth of our country in the interests of a few powerful tobacco organizations whose rapacity knows no bounds."

"Whatever may be said of tobacco as a moderate indulgence, it is clear that the issue raised before the country in some of the current cigarette campaigns is the issue raised by urging excessive cigarette smoking, by flaunting appeals to the youth of our country, by misrepresenting established medical and health findings in order to encourage cigarette addiction."—*New York Times*, June 11, 1929.

DEATH AFTER AVERTIN ANÆSTHESIA

Drs. MacWilliam and Wilson, of the Walton Infirmary, Liverpool, England, in the *British Medical Journal* (2: 1141, June 22, 1929), report the following interesting case:—

"The patient, a young and apparently healthy adult, was admitted to hospital on June 10th suffering from a right inguinal hernia. No sign of disease could be detected in the heart, lungs, or kidneys. He had the customary preparation—that is, a laxative on the evening of the operation and simple rectal washouts the following morning. At 5.30 p.m. his blood pressure was 125 mm. Hg, and morphine hydrochloride gr. $\frac{1}{4}$ was given.

The dose of avertin given was 5 c.cm. in a 3 per cent solution, which was rather less than 0.1 gram per kg.; this was given at 6 p.m. It had been intended to supplement this with intrathecal novocain or gas and oxygen.

At 6.30 p.m. the operation was commenced. It was found that the anæsthesia was deeper than we desired for combination with spinal novocain, but not sufficiently deep for the operation to be carried out. The patient was somewhat cyanosed, but after the administration of a little gas and oxygen the colour rapidly became satisfactory. The operation was concluded at 7 p.m., and no anxiety was felt with regard to the patient's condition. During the operation his blood pressure was again taken and found to be 118 mm. Hg.

At 9.30 p.m. the patient was a little cyanosed, but respirations were regular in frequency and depth, and the volume of the pulse was excellent. Consciousness had not been regained. At 12

midnight cyanosis was more marked, and the pulse commenced to fail. Artificial respiration was resorted to, strychnine was given, and, finally, intracardiac adrenaline. In spite of all efforts the patient died.

A post-mortem examination was made by Dr. Stuart McAusland, lecturer in anæsthetics, David Lewis Northern Hospital, Liverpool. He reported the presence of a thymus gland weighing slightly more than $\frac{1}{2}$ ounce, slight congestion of the lungs and brain, normal appearance of the rectum and other organs.

The conclusion which we draw from this case is that this man failed to eliminate the drug. The method of fractional administration as approved by Mr. Morrin would not have aided us, as our patient actually had less avertin than he advises for the initial dose. We must add that the drug has given very satisfactory results in all the cases in which it has been used previously in this hospital."

Medico=Legal

[In view of the great importance of the Medical Act of Alberta and its practical application, we feel that the publication of the following letter and legal judgment will interest the medical profession far beyond the confines of the province concerned.—ED.]

Calgary, July 15th, 1929.

Dr. T. C. Routley,
Toronto, Ont.

Dear Doctor:—

We are sending you herewith a copy of a decision of the Court of Appeal of Alberta, in the matter of an investigation into the charge of unbecoming and improper conduct on the part of a physician in this province.

In 1928 we had our medical act amended so that all technicalities, over which lawyers fight and prolong litigation, were eliminated. (A copy of this amended Act was sent you.) The principal new features were as follows:—

Sec. 45, Sub. D.

"The Discipline Committee shall investigate the facts regarding any medical practitioner, whose conduct in the opinion of the Committee ought to be investigated."

You will note that it is necessary only for the Committee to consider it necessary; they do not have to wait a formal charge.

Sec. 56, Sub. 2.

"Evidence may be adduced before the Council or Discipline Committee, either by affidavit or viva voce, or both, as the Council or Committee may determine, but no medical practitioner's name shall be erased from the register on affidavit evidence alone."

Sec. 57, Sub. 5.

"The Council or Committee shall not be bound

by the rules of evidence obtaining in actions and proceedings in the courts of justice, but, on the contrary, may proceed to ascertain the facts in such manner as it shall deem proper."

Sec. 47a.

"Unbecoming and improper conduct, professional or otherwise, within the meaning of this Act, shall be a question of fact for the sole and final determination of the Council or Discipline Committee, and any matter, conduct, or such thing, as in the judgment of the Council or Discipline Committee is such as to be inimical to the best interests of the public, or the profession, shall be a conduct unbecoming a member of the medical profession."

Sec. 47, Last line

"Provided that there shall be no appeal from an order unanimously made by the Council."

In the case in question, the Discipline Committee recommended six months' suspension for unbecoming and improper conduct. In this the Council concurred. An appeal was taken by the doctor to the Supreme Court of Alberta. Mr. Justice Ives, sitting, dismissed the appeal, stating that, as he had held in another case, the council or committee were the sole judges as to what constituted unbecoming and improper conduct, and they had found defendant guilty; further the decision was unanimous, and therefore not subject to appeal.

A request was made to him the next day to permit an appeal from his decision, which he granted, and the judgment we are enclosing is the decision of the Court of Appeal of Alberta, which court held with the council, stated that the evidence as submitted to the Discipline Committee was not subject to review by the Supreme Court or the Court of Appeal. that the Com-

mittee had the right to decide what was unbecoming, and, further, the council being unanimous, the matter was settled.

As this will be of value to the profession at large, we would suggest that perhaps you might put the matter in the Canadian Medical Association Journal, leaving out the name of the individual doctor.

Yours truly,

(Signed) W. G. HUNT,

Assistant to Registrar.

IN THE SUPREME COURT OF ALBERTA

Appellate Division

.....

Re COLLEGE OF PHYSICIANS AND SURGEONS

and

.....

JUDGMENT

Of the Honourable, the Chief Justice

This is an appeal from the decision of Ives, J., refusing to quash an order made by the Council of the respondents suspending the appellant from practice for six months.

There is no appeal from such an order when the Council is unanimous, as was the case here. In consequence proceedings were taken by way of certiorari.

Mr. McGillivray has gone into the evidence and strongly urges that there is no sufficient evidence to justify the order made by the Council and that a great injustice has been done the Appellant.

The question we have to consider is whether even if that be the case we have the authority to right it, for we must decide the appeal on legal and not sympathetic grounds.

It is necessary, therefore, to consider with some care what are the powers of the Court upon certiorari for Mr. McGillivray strenuously maintains that we may look at the evidence for the purpose of reaching our conclusion, and he argues that the decision in *R. vs. Nat Bell*, 1922, 2 A. C. 128 which held that that could not be done is binding only in respect to summary convictions.

In *R. vs. Pudwell* (1916) 26 C.C.C. 47 my brother Hyndman held that the evidence could not be looked at for the purpose of an application to quash on certiorari.

In the same year, in *R. vs. Carter* 9 A.L.R. 481, 26 C.C.C. 51, I went somewhat at length into the authorities and came to the same conclusion. A few years later this division, composed of four judges, unanimously came to the opposite conclusion in *R. vs. Emery* (1916) 10 A.L.R. 139, thereby displacing the authority of the two previous decisions. Our Courts acted on this view until the *Nat Bell* decision by the Privy Council above mentioned, which in terms displaced the authority of *R. vs. Emery* and held

that the view of the earlier decisions was the correct one. The *Pudwell* and *Emery* cases were both cases of indictable offences tried summarily by a Magistrate, while the *Carter* case was one of a summary conviction, but no distinction was made in the reasons in this regard, but in the judgment in the *Nat Bell* case it is pointed out that while it was a case of summary conviction the *Emery* case was one of an indictable offence, and the judgment declares that "Their Lordships wish to keep open this distinction if it be one," and then proceeds to consider the principle in its general application.

Subsequently this division held in *R. vs. Oakes* (1923) 19 A. L. R. 501 that the *Nat Bell* decision did not apply in the case of an indictable offence and looked at the evidence and this was later confirmed in *R. vs. Kramer* (1924) 20 A.L.R. 244.

It is contended that the effect of these last two decisions is to limit the application of the *Nat Bell* decision to summary convictions, but, as *Beck, J.* was so careful to point out in *R. vs. Oakes*, decision is only authority for what it decides; therefore, these decisions must be considered as only authority for the right to look at the evidence in case of indictable offences and in so far as principle or reasoning is concerned the decision of the Privy Council is, of course, one of the highest authority for us.

It was held in *R. vs. Nat Bell* that the law had been properly laid down in *Reg. vs. Bolton* 1 Q. B. 66, and had been applied to the Dominions by *Colonial Bank of Australasia vs. Willan*, L.R. 5 P.C. 417. Willan's case was not a criminal case, and it was argued that there was a difference between Civil and Criminal cases, but Lord Sumner delivered the judgment of the Committee at p. 154 when he says "The whole theory of certiorari shows that no such difference exists. The object is to examine the proceedings in the inferior Court to see whether its order has been made within its jurisdiction. If that is the whole object there can be no difference between civil orders and criminal convictions, except in so far as differences in the form of the record of the inferior Court's determination or in the Statute law relating to the matter may give an opportunity for detecting error on the record in one case which in another would not have been apparent to the Superior Court, and, therefore, would not have been available as a reason for quashing the proceedings."

Again, at p. 156, he says "That the Superior Court should be bound by the record is inherent in the nature of the case. Its jurisdiction is to see that the inferior Court has not exceeded its own, and for that very reason it is bound not to interfere in what has been done within that jurisdiction, for in so doing it would itself, in turn, transgress the limits within which its own jurisdiction of supervision, not of review, is confined. That supervision goes to two points: one is the area of the inferior jurisdiction and the qualifications and conditions of its exercise; the other is the observance of the law in the course of its

exercise." And again, at p. 161, "There is not one law of certiorari before 1848 and another after it, nor one law of certiorari for England and another for Canada" and he concluded his reasoning on this branch at p. 165 where he says:

"Their Lordships are of the opinion that the provisions of the Canadian Criminal Code and of the Alberta Liquor Act have not the effect of undoing the consequences of the enactment of a general form of conviction; that the evidence, thus forming no part of the record, is not available material on which the Superior Court can enter on an examination of the proceedings before for the purpose of quashing the conviction, the jurisdiction of the magistrate having been once established, and that it is not competent to the Superior Court, under the guise of examining whether such jurisdiction was established, to consider whether or not some evidence was forthcoming before the magistrate of every fact which had to be sworn to in order to render a conviction a right exercise of his jurisdiction."

It seems clear from this that where there is no statutory provision making the evidence part of the record it cannot be looked at for the purpose of quashing the conviction or order, because it does not really affect the question of jurisdiction. There is nothing in the Act under which the Council purported to act that could have the least application to the matters now under consideration which must, therefore, be dealt with under the general principles declared in that case to be applicable.

The only ground, therefore, which is open to the appellant is error on the face of the record.

It is contended that the appellant is charged with one thing and found guilty of something quite different. The fact is that he is charged with unprofessional conduct and it is of that that he is found guilty. It is true that what the unprofessional conduct consisted of is not expressed in exactly the same terms in the charge as in the findings of guilt but I cannot see that even in respect to that there is any difference of substance.

Then it is urged that the order directs the registrar to suspend the appellant, whereas the statute only authorizes the Council to suspend him.

The Medical Profession Act C 209 R.S.A. 1922 provides (Sec. 45) that charges of this sort shall be investigated by the Discipline Committee which shall report to the Council "And if the Committee finds that the medical practitioner has been guilty of an offence which warrants it, and so reports to the Council, the Council may

direct the Registrar to erase the name of such registered practitioner from the register, or the Council may, in its discretion, suspend such person from the privilege of a registered practitioner for such time not exceeding three years at it sees fit, etc.

The Committee recommended:—

"That Dr. . . . be suspended from the practice of medicine in the Province of Alberta for a period of six months," and the Council resolved that that recommendation "be and is hereby approved of and the Registrar is hereby authorized and instructed to suspend the said Dr. . . . from the practice of medicine in the Province of Alberta for a period of six months, commencing June 1st, 1929."

As was pointed out in the argument all orders-in-Council are made in just that way by the recommendation to the Sovereign or his representatives and his marking it "approved."

The approval by the Council of the Committee's recommendation was the Council's order for a six months' suspension, and the direction to the Registrar is for his guidance and communication to the Appellant that that six months was to run from June 1st, 1929.

Then it was argued that by the terms of Section 46 the Committee could only recommend such suspension when coupled with its own suspension till the Council's next meeting. Whether there might be force in this argument if Section 46 stood alone need not be considered, for the provisions of Section 45 already quoted are sufficient statutory authority for what was in fact done.

Then it is said that the appellant is not shown to have been a medical practitioner and so subject to the Council's jurisdiction. That would appear to be really a question of evidence not open for consideration but if it were I am of opinion that though there is no direct evidence of the fact there is plenty of evidence from which the inference could be properly and certainly drawn.

On none of the grounds mentioned or on any other am I able to see any valid reason for questioning the legal sufficiency of the Council's order and I would, therefore, dismiss the appeal with costs.

(Signed) HORACE HARVEY,
C. J.

Calgary, Alta. 26th June A.D., 1929.

C. F. Adams, Esq., K.C., for the Respondent,
College of Physicians and Surgeons. A. A. McGillivray, Esq., K.C., and F. C. Moyer, Esq., appeared for the Appellant.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

On the 28th of May, the citizens of Edinburgh celebrated the six hundredth anniversary of the granting of a Charter to the Burgh and to the Port of Leith by King Robert the Bruce in 1329. This Charter is important chiefly because it is the earliest Royal Charter to the City of Edinburgh extant. Previous Kings of Scotland had granted charters to the city prior to 1329, but these, owing to the perpetual bickerings of the day and the vicissitudes of war with the "auld enemy" England, had been lost, stolen or destroyed. This six hundredth anniversary is not that of the foundation of the city, nor its creation as a Royal Burgh. Edinburgh is, in fact, one of the oldest Scottish Burghs, and from the earliest times held its territory and privileges direct from the sovereign. Part of the official program to commemorate the event was the unveiling of memorials to Sir William Wallace and to King Robert the Bruce, on the Castle Esplanade, by his Royal Highness the Duke of York, who was accompanied by the Duchess. Representatives from various public bodies, including the University and the Royal Colleges of Physicians and Surgeons, attended this ceremony which was preceded by a religious service in St. Giles Cathedral and followed by a civic luncheon in the Assembly Rooms.

During their stay at the palace of Holyroodhouse the Duke and Duchess of York paid visits to various medical and nursing institutions in the city. In addition to performing the ceremony of laying the foundation of the Gogarburn Institution for Mental Defectives, their Royal Highnesses spent some time at the Edinburgh Royal Infirmary. They first went to the surgical ward of Mr. J. W. Struthers, and subsequently visited the medical side of the hospital, where they were received by Professor Edwin Bramwell and Dr. Fergus Hewat. A surprise visit was also paid to the massage department in the new radiological building. The Duchess of York visited the headquarters of the Scottish Branch of the Queen's Institute for District Nursing, of which she is the President. During the forty years of its existence this Institute has trained and found appointments for 722 nurses in various parts of Scotland. The nurses come to the Institute fully trained from various hospitals, and are employed nursing the sick poor in Edinburgh, with a superintendent to teach them. After this additional specialized training they are sent out to districts that apply for a Queen's nurse. They are to be found in all parts of Scotland, in the remote highlands and islands, as well as the lowland agricultural and industrial districts. Wherever they go their work is characterized by the highest skill and industry. In addition, their training in the homes of the poor has taught

them independence, self-reliance, and the art of improvising and making the best use of such materials as come first to their hands. At present there are 87 nurses training in the Institute. The Duchess of York also paid a visit to the Edinburgh Royal Maternity and Simpson Memorial Hospital. The Duchess was taken round several of the wards by Professor Johnstone and Dr. Hugh S. Davidson.

Amid the many honours that have been conferred on the retiring Principal of the University none is more notable than the award of the Albert Medal of the Royal Society of Arts for his work on magnetism and his services to technical education. Since its institution this prize has only been awarded to sixty-nine persons. There are two Albert Medals. These were founded in memory of the Prince Consort. One is bestowed by the Sovereign for life-saving. The other is granted annually by the Royal Society of Arts for merit in promoting arts, manufactures and commerce. A glance at the list of the former recipients shows that Sir Alfred Ewing has joined a distinguished company of famous men and women who have already been accorded this honour. Sir Rowland Hill, who introduced the penny post, was the first recipient. Among others who have received the medal are Michael Faraday, Ferdinand de Lesseps, of Suez Canal fame, Sir Henry Bessemer, Lord Armstrong, Lord Kelvin, and Louis Pasteur. In more recent years we find such well-known names as Madame Curie, Senator Marconi, Sir David Bruce, Sir Ronald Ross, and Sir Aston Webb.

At the fiftieth annual meeting of the Edinburgh University Club of Manchester, the guests of the Club were the Right Honourable Sir Auckland Geddes, G.C.M.G., and Sir David Wallace, K.B.E., Dr. A. Corsar Sturrock occupied the chair, and members and guests to the number of one hundred and twenty dined together. A most enjoyable evening was spent, due in large measure to the contribution made by the former British Ambassador to the United States.

In addition to that in Manchester, Edinburgh University Clubs exist in a flourishing condition at Aberdeen, Birmingham, Sheffield, London, the North of England, the West Riding of Yorkshire, and Cape Town.

At the Graduation Ceremonial on the 27th of June the Senatus Academicus awarded the honorary degree of Doctor of Laws to Abbott Lawrence Lowell, Ph.D., LL.D., Litt.D., President of Harvard University.

Lieut.-Col. A. G. McKenrick, I.M.S., (ret.) Superintendent of the Royal College of Physicians' Laboratory has been invited to analyze and report on the statistics of the antirabic institutes of all countries, for the Health Department of the League of Nations.

Dr. J. S. Fraser, F.R.C.S., Edinburgh, has been

awarded the Freeland Barbour Fellowship of the Royal College of Physicians for his work on the Pathology of the Ear, carried out in the Research Laboratory of the Royal College of Physicians.

The old Craighleith Poorhouse on the northern side of the city has been reconditioned and opened by the Edinburgh Parish Council as a hospital. The opening ceremony was performed by Dr. J. Parlane Kinloch, Chief Medical Officer of the Department of Health for Scotland. This institution was originally opened in 1868. During the war it was taken over by the government as a military hospital—the Second Scottish General Hospital. After the war the building was used by the Pensions Ministry as a hospital, and was finally handed back to the Parish Council some two years ago. Under the Local Government (Scotland) Act, 1929, which is to sweep away all Parish Councils, this Institution will be handed over to the town council and become a municipal hospital.

GEORGE GIBSON.

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

The ninety-seventh annual meeting of the British Medical Association has just come to a successful conclusion. Most of the important papers read at the scientific sections and a full account of the business discussions will be reproduced during the next few weeks in the *British Medical Journal* and here only an impression of the meeting as a whole will be attempted. This in itself is almost superfluous this year for the presence of Professor Harvey Smith, of Winnipeg, the President nominated for 1930, was a sufficient guarantee that Canada would be told all about the proceedings at Manchester. Of the business meetings it can be said that while the discussions reached their usual high level there was less disagreement among the representatives and in consequence decisions were reached more easily and the work of the Council for the forthcoming year ought to be straightforward under the guidance it has received. The position of the voluntary hospitals and the future policy of the Association with regard to such matters as pay-beds in the voluntary hospital, remuneration of the honorary staffs, etc., have been discussed from time to time in these notes, and at Manchester the meeting was concerned not so much with theoretical details of the difficulties of the future but rather with the best methods of carrying out an agreed policy. The development of the Public Health Service, especially in view of the new Local Government Act, was considered particularly as concerns the salaries of officials in this service and the scheme put forward was accepted with surprisingly little dissent. The report on psycho-analysis was made much of in the lay press and a close reading of this will well repay the time spent, for it represents a very

careful survey of the situation and is a good example of the Association's very fair method of dealing with such problems.

In 1921 a committee, presided over by the Earl of Athlone, came to the conclusion that the facilities for teaching public health work in London were very scattered and they recommended a new post-graduate institution to meet this position under the name of the Institute of State Medicine. Last month H.R.H. the Prince of Wales opened the new London School of Hygiene and Tropical Medicine which represents a carrying out of the Athlone Committee's recommendations. The old school of tropical medicine founded by the Seaman's Hospital Society has, by its own will, become merged with the new school of hygiene and the building was made possible by a magnificent grant from the Rockefeller Foundation of £460,000. The running expenses of the building thus provided are to be met partly by a grant from the British Government and its international nature was rightly emphasized by various speakers at the evening ceremony. Situated in Gower Street close to University College and the British Museum, almost adjoining the new site for London University and very near to the Endsleigh Gardens Hospital for Tropical Diseases, the new building is magnificently central and is a noteworthy addition to academic architecture. The director of the school will be Dr. Andrew Balfour, and he has associated with him a strong staff of well-known leaders in preventive medicine. As the Prince of Wales said, "there are no territorial frontiers in hygiene," and at the new school it is hoped to train men and women of all nationalities desirous of entering the public health services of this country and abroad.

The discussions on damp and its relation to the rheumatic group of diseases threaten to drag on almost interminably, although at long last the majority of physicians seem to be agreeing that they have a definite connection at any rate as far as children are concerned. This fact may go a long way to explain the frequency of acute rheumatic fever and its cardiac complications in these islands with the customary humid climate, but it might be thought that so long as our houses were dry the weather outside did not matter so much. As a matter of fact, it is the law of the land that a dwelling house must not be damp but this high legal ideal is only faintly realized. An interesting co-operation between the British Medical Association's Committee on Rheumatic Heart Disease in Children and the Royal Institute of British Architects has produced a report which is unpleasantly startling. It appears that a properly qualified architect is concerned with the building of only 13 per cent of residential houses, and that while by-laws and regulations ought to ensure that houses are properly constructed to avoid damp this does not work out satisfactorily in practice. In other words, the majority of our houses are damp because they are imperfectly built, and if rheumatic heart disease

has some connection with this the first step would seem to be the enforcement of existing laws to make our houses dry. This work of the Royal Institute of British Architects in association with the profession is the first of its kind and it is hoped

that further co-operation on matters of mutual interest may take place.

ALAN MONCRIEFF.

London, August, 1929.

Abstracts from Current Literature

MEDICINE

Bronchoscopic Findings in Lobar Pneumonia.

A Preliminary Note. Coryllos, P. N., *Am. J. M. Sc.* 178: 8, 1929.

That lobar pneumonia is essentially a pulmonary atelectasis produced as a result of the blocking of a bronchus by the inflammatory reaction to the pneumococcus, and that the pneumonic lung is actually smaller than its normal fellow on the opposite side, are the startling results of the clinical and experimental investigations of the author.

Experimental lobar pneumonia in the dog induced by insufflating into a bronchus a concentrated culture of the pneumococcus elicited the fact that this bronchus did not breathe. A plug of brownish viscid fluid occluded the bronchus. When this plug was removed by aspiration the lung became partially aerated. Skiagrams of the lungs showed a picture indistinguishable from pulmonary atelectasis produced as a result of ligating a bronchus. Moreover, when the chest was opened after tying the trachea so that air could not enter, it was found that the affected lung was actually in a state of partial atelectasis, being definitely smaller than the normal one.

In order to confirm these findings in the human subject with lobar pneumonia, nine cases were bronchoscoped early in the course of the disease. No untoward effects are said to result from the bronchoscopy. In all nine cases the bronchus corresponding to the consolidated area was occluded and the circulation of air shut off. In one case which died the chest was opened after the trachea had been clamped. It was found that the consolidated lung was smaller than the normal one. These findings were further supported by the appearance of the shadow in the skiagram and the slight displacement of the trachea and heart to the affected side.

The author's conclusions therefore are that the mechanism of the production of lobar pneumonia is plugging of a bronchus followed by atelectasis of the corresponding lobe. It follows that the affected lobe in pneumonia, contrary to the general opinion, is smaller than its normal fellow. The error in the current conception has resulted from the appearance of the lungs when the thorax is opened without

first clamping the trachea. The opening of the thorax destroys the negative pleural pressure, the normal lung elasticity brings about contraction, and air is forced out. When the trachea is clamped this cannot occur. The author believes that many puzzling problems in connection with the physio-pathology of pneumonia are explained by his observations. Some of these are: the lobar distribution of the disease; the sudden onset preceded by slight bronchial catarrh; the diminished breath-sounds at the onset; the wedge-shaped roentgenographic shadow at the very onset of the disease; the predominance of pneumonia in the lower lobes, especially the right; and the frequent displacement of the trachea to the affected side.

Further experimental studies on dogs made in conjunction with G. L. Birnbaum, and reported at the same time (*Ibid.*, p. 15-20) offer additional proof of his contentions.

E. S. MILLS

Complications and Fatality of Typhoid Fever Among Filipinos. Lantin, P. T. and Ignacio, P., *Am. J. M. Sc.* 178: 39, 1929.

This review of typhoid fever is of considerable interest because the conclusions are based on a series of 3,255 cases accurately observed at the Filipino General Hospital, Manila, since 1910. The facts elicited may be summarized as follows: (1) Almost twice as many males as females were affected. (2) Three-quarters of all cases occurred between the age limits of 11 and 30 years. (3) No decrease in the incidence of the disease over the 17 year period was noted. (4) Intestinal hæmorrhage occurred in 338 cases, or 10.3 per cent of the series. (5) Perforation took place in only 38 cases, or 1.16 per cent. (6) Lobar and bronchopneumonia complicated the disease in 145 and 133 cases, or in 4.4 per cent and 4.0 per cent. (7) Other complications included severe toxæmia in 322 cases (9.9 per cent); acute myocarditis in 320 cases (6.7 per cent); acute nephritis in 39 cases (1.2 per cent); acute cholecystitis in 34 cases (1.0 per cent); and parotitis in 15 cases (0.46 per cent).

The mortality was 19.2 per cent, almost identical with the figure given by Jaccoud for 64,600 cases (19.64 per cent). It is of interest that death occurred in 97 per cent of perforations, 40 per cent of hæmorrhages, 50 per cent

of pneumonias, and in about 60 per cent of the cases showing severe toxæmia. When the authors compared their statistics with those from other reliable sources it was found that the incidence of intestinal perforation was low, and that of hæmorrhage and pneumonia relatively high.

E. S. MILLS

A Case of Diabetes Mellitus Showing Aglycæmia Without Symptoms. Peters, C. A., and Rabinowitch, I. M., *Am. J. M. Sc.* 178: 29, 1929.

The authors report a case of moderately severe diabetes with hyperglycæmia, who exhibited no symptoms of insulin shock when overdoses of this drug were given. Examination of the blood at hourly intervals during a fasting period of 9 hours after 10 units of insulin showed that the fermentable sugars in the blood (glucose) had practically disappeared. Two hours after the insulin was given the blood glucose was 0.001 per cent, and six hours later it was still 0.005 per cent. During this period of time the subject of the experiment presented none of the signs or symptoms usually associated with inordinate lowering of the blood sugar.

The authors suggest that hypoglycæmia is not the only cause of the train of symptoms which as a rule result from an overdose of insulin.

E. S. MILLS

A Note on Narcolepsy. Kennedy, A. M., *Brit. M. J.* 1: 1112, June 22, 1929.

The recurrence of paroxysmal attacks of sleep of an irresistible nature has received considerable attention. Kinnier Wilson summarized the current knowledge of the various forms of narcolepsy last year and collected records of 43 cases. Some of these prove to have pathological lesions, such as cerebral arteriosclerosis, cysts, encephalitis lethargica, etc., but in others no definite cause can be assigned and at present must be given the title "idiopathic."

Included in this class is the type of case reported by Dr. Kennedy. The patient was a chauffeur of 26, in whom the symptoms of narcolepsy had been present for thirteen months before visiting the doctor. There was nothing special in his history except mild symptoms of some vasomotor disturbance. At the age of 22 he began to have transient attacks of double vision, which came on about once a month, lasting for five or ten minutes. These gradually became more frequent. Three years later, sensations of fullness and throbbing appeared, and for the first time attacks of drowsiness. These last would come on quite suddenly, with no warning "aura." After some months he was

forced to give up driving a car, as the attacks of drowsiness nearly caused him several accidents.

He came to hospital for observation and was there for seven weeks, during which time it was noted that he showed spasmodic movements of the limbs, head, or body on very slight stimulation. These, with occasional flushings of the face and restless nights, were the most notable signs he presented. Physically, no abnormality could be made out. X-ray and all other laboratory examinations were negative. Two months after leaving hospital he had his first definite cataleptic attack, which came on while crossing the street. He had recurrences of this throughout the next two months, but gradually it wore off.

It is now twenty months since the onset of his symptoms, and he has shown none of the ordinary signs of intracranial tumour. His condition seems to be improving generally.

H. E. MACDERMOT

Poisoning from Commercial Methyl Chloride. *Chicago's Health* 23: 90, July 15, 1929.

Modern progress is not without its disadvantages, and the advent of the electric refrigerator has added a new danger to the already harassed householder. Recent newspaper reports from Chicago described fatalities presumably from methyl chloride used in the process of electric refrigeration. The latest bulletin of the Chicago School of Sanitation Instruction gives an account of this. During the past year there have been reported in Chicago 25 cases of poisoning by commercial methyl chloride gas, with 7 deaths. Practically all the cases developed in so-called kitchenette apartments equipped with electric refrigerators which were leaking. The characteristic symptoms were drowsiness, mental confusion, weakness, nausea and vomiting. The pulse and temperature was usually increased, and 2 of the fatal cases had temperatures of 107.° In nearly all these cases there was prolonged anuria (some as long as 48 hours). According to Baker, who reported in 1927 twenty-one cases among workmen engaged in the manufacture of these refrigerators, formates are usually found in the urine. In the only 2 cases examined for this in Chicago formates were found.

There is evidently a real hazard here which the medical profession should be aware of. The Health Commission of Chicago has drafted an ordinance regarding the construction and installation of electric refrigerators. Such measures might be considered by the Canadian health authorities.

FRANK G. PIERCE

Public Instruction in Medicine. Robey, W. H. The Shattuck Lecture, (Read before the Annual Meeting of the Massachusetts Medical Society, June, 11, 1929).

Why should not the public want to learn about medicine and disease? People are better educated than ever before; their minds are more receptive and perceptive. Yet, when you discuss medicine with your most intelligent patients you will find a mass of superstitious survivals and distorted theories.

The physician of to-day is still bound by tradition. There is still a tacit acceptance in general that any form of publicity emanating from or referring to a physician, even for the public weal, is a breach of professional ethics, in that attention is called to that particular physician. Yet, a sufficient number of physicians, whose integrity is beyond question, have sought in a variety of ways to reach the public ear with instruction in the incipient signs of the disease which they have become eminently qualified to discuss.

Most physicians are individualists. A general practitioner may be too much occupied with the ever changing scenes of his daily routine to spend the time upon the accumulation of data and the publication of the facts deduced. At the end of a taxing day of travelling, diagnosing, and advising, he may be too weary to do more than jot down the salient points of his cases, but here exists one of the greatest opportunities for important community service. Every city has its clubs who are showing an increasing desire to put medical papers on their programs. Every physician who is invited to appear before any group is urged to realize that he has at least one talent not to be securely wrapped in a napkin but which it is his privilege to invest in public welfare, in order that it may yield a return in more intelligent understanding regarding disease which our profession is eager to place at the disposal of all who wish to learn.

Public lecture courses are given at Harvard, Boston University, and at Johns Hopkins. The essentials of the lecture are given in the daily press and create more or less discussion among the various groups.

There is no more opportune time for establishing the right point of view in matters medical and sanitary than during the hours of hospital life. There are nurses who, without seeming effort, transform the mental attitude of the patient so that he leaves the hospital a messenger of better living to his community. The author's plea is for greater recognition of the hospital on its educational side. It would be a desirable achievement if some methodical instruction could be given to internes in the elements of their relation to patients beyond

the diagnosis and treatment of disease. More and more should our young doctors appreciate their responsibilities in the community at large if they are to share in the campaign of enlightenment which is already under way, but which must be supported with constant vigilance if it is to become widespread and still more productive of satisfactory results.

Charlatans have always existed and always will, unless there is a universal scientific education and a very radical change in human nature. To many, even among the civilized, there is something mysterious about disease, and we are still faced with unreasoning opposition to scientific medicine, and with onslaughts of bitter antagonism.

Legislators do not as a rule belong to an un-intelligent class, and most of them have personal physicians from whom they should learn the rights and wrongs of various forms of practice. Attendance at legislative hearings is for us both irksome and time-consuming, yet it is a duty to indicate to the public, by our presence, and, if possible, by our speech, the interest and belief which we hold in the maintenance of the laws of health and rational medicine. The indifference to community duty costs us dearer than we sometimes realize. But the people are not fools; they are mere children in medical matters, accepting the benefits in public health measures as infants do their food and raiment, and fail to realize that victories for the common welfare have been slower and more difficult in the winning than those on the fields of honour. If the laity knew more about the history of medicine, knew that when smallpox, one hundred and seventy-five years ago, passed through an unvaccinated English village two-thirds of the inhabitants were left in the churchyard, would it be so willing to allow the scourge to return?

Not long ago the *New York State Journal of Medicine* suggested that county medical societies should hold a public meeting once a year. It is an idea to be given serious and prompt consideration.

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Another question which the laity may possibly decide for us in the near future, if we do not as a profession take some action, is birth control. For several years a group of earnest and intelligent men and women in Boston have been at work on the question, and if we are not careful we shall be aroused from our slumbers to find that we are playing a secondary part. If a chapter of medical history

is to be written, are we, or propagandists, to be the authors? If, after organized investigation, we reach the conclusion that such a chapter should not now be written, we shall have squarely faced our responsibility.

LILLIAN A. CHASE

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Statistics have been collected from many surgeons using different types of operations and the results compared with 53,000 injections reported by the author.

Varices of the lower extremity alone are discussed. Changes here are of low-grade inflammatory nature. A reverse flow results in the affected veins.

The average time before resuming work in surgically treated cases was 34.8 days. No time is lost in the injection treatment. Embolus occurred in 0.53 per cent of surgical cases; in 0.00754 per cent of injection cases: 0.41 per cent of cases treated surgically died. Operative care demands a hospital stay of 15.1 days; injections, none. Recurrence following injection will be impossible if sufficient of a suitable solution is injected to destroy the intima. The resulting thrombus is organized and a fibrous cord results. As the fluid also reaches the collaterals these are obliterated. Five-year recurrences following surgery were 19.2 per cent, according to twenty-two replies received. Sloughs and periphlebitis following injection are due to errors in technique.

The author considers the injection method a great step forward in the care and treatment of varicose veins.

R. V. B. SHIER

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The authors first define bile peritonitis and bile ascites. Bile peritonitis follows the effusion of bile in the peritoneal cavity, the result of injury, the slipping of a ligature, or from extravasation; bile ascites, or bilious peritonitis, being major ascitic accumulations in the peritoneal cavity resulting from portal obstruction which are bile-stained from an existing jaundice.

The symptoms of bile peritonitis are those of an acute or subacute peritonitis; fever, an increase in the polymorphonuclear leucocytes, early and marked abdominal tenderness, and rigidity associated with varying degrees of distention. Vomiting is early and persistent. The urine first shows evidences of an irritative nephritis, and later there is anuria. Bradycardia and hypotension with a slow irregular respiration are observed early.

Several factors have been thought responsible for the toxic property of bile. Some held that the pigment and salts were responsible, while others suggested impurities in the bile. However, the consensus of opinion at the present time is that the bile salts are the toxic agent.

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The conclusion is that the occurrence of authentic bile extravasation, or bile peritonitis without perforation, has not yet been proved.

We may conclude, therefore, that in those cases in which bile peritonitis occurs there must have been at one time or other an opening having a direct connection with the biliary passages, and also that it is not necessary for bile to be infected to cause bile peritonitis. Bilious peritonitis would appear to be the result of an ascites occurring when the patient has a general icterus, rather than a filtration of the bile through the extrahepatic ductal walls.

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The value of this test lies in this, that at the time of operating the surgeon can distinguish between normal and cancerous tissue, and can plan his operation accordingly; also, when a part has to be removed for microscopic examination the surgeon can be sure that he has removed a suitable portion; the pathologist can also check the surgeon's work by examining the removed tissue and determining whether or not a portion of the new growth has been left behind. The test is equally applicable to tissue that has been removed. If the colour has faded it can be renewed in the laboratory by again painting the tissue with the solution.

A. G. NICHOLLS

PÆDIATRICS

A Statistical Study of the Rate of Skeletal Growth in Juvenile Diabetes. Rabinowitch, I. M., and Bazin, E. V., *Arch. Dis. Child.* 4: 21, June 1929.

In a study of diabetic children at the Montreal General Hospital, the authors confirm an observation made at Joslin's clinic in 1927, that children with diabetes tend to be overheight. Of the seventy-one children investigated, forty were overheight for their age on admission to the clinic. In addition, they observe that after the institution of treatment the average rate of growth of these diabetic children was less than normal. This they relate to the further observation that in all children admitted to the general clinic, the rate of growth was least in those who were overheight.

Seventy-one overheight normal children grew while under observation at a rate that was 112 per cent of the normal, while the seventy-one diabetics showed a rate of growth that was only 75 per cent of the estimated normal. Statistical proof is given that the finding is not a chance occurrence.

It would thus appear that a common stimulus causes diabetes and excess skeletal growth in the child. The authors suggest that the anterior lobe of the pituitary body by means of its associations with the sympathetic nervous system may be the factor responsible for diabetes in overheight children. The necessity of further studies is pointed out.

A. K. GEDDES

Infections as a Source of Recurrent Epileptiform Seizures in Children. Paterson, D., and Bray, G. W., *Arch. Dis. Child.* 4: 21, June 1929.

Twelve children under the age of nine years, all of whom had had recurrent bouts of epileptiform convulsions with fever and acetonuria, were studied with the object of ascertaining the cause and significance of the convulsions.

In three-fourths of the cases the convulsions

commenced during the period of first dentition. There was an average of 5.25 seizures per patient and an average interval of 4½ months between attacks. The average period of observation was two years. In over 80 per cent of the cases naso-pharyngeal infection appeared to be the cause of the convulsions, and in half the cases the diet had been excessively high in fats. During the intervals the children showed no abnormality either mental or physical.

The fever, acetonuria, ketogenic diet, and lack of mental deterioration rule out idiopathic epilepsy as the cause. Nor do these children later become epileptics. Experimental evidence that acetone may cause convulsions is reviewed, and the hypothesis advanced that the seizures in these cases may be due to acetone in the blood and spinal fluid.

The treatment is the eradication of all foci of infection and the institution of a diet liberal in carbohydrates and moderate in fats. The prognosis for recurrence depends upon prophylaxis against infections. The prognosis for mentality is good.

A. K. GEDDES

The Intelligence of Epileptic Children. Dawson, S., and Conn, J. C. M., *Arch. Dis. Child.* 4: 21, June 1929.

From a statistical study of 49 epileptic children in Glasgow, Dawson and Conn conclude that their average intelligence is definitely subnormal, varying in individual cases from normalcy to imbecility; there is deterioration directly due to the epilepsy; they come from a stock which seems to be normal as far as intelligence is concerned; there seems to be no relation between the degree of mental deterioration and the length of time the patient has had convulsions; neither is there evidence of any relation between the frequency or severity of the seizures at the time of hospitalization and subsequent improvement in the general condition of mental progress; there is a definite correlation between improvement in general condition and mental progress.

A. K. GEDDES

PATHOLOGY

Das Glycogen des Blutes bei pathologischen Zuständen. (The glycogen of the blood in pathological conditions.) Schwarz, L. S., and Gerson, S. L., *Deutsches Archiv f. klin. Med.* 164: 96, May 1929.

The interest in glycogen, that fundamental substance in carbohydrate metabolism, dates from 1857, when Claude Bernard discovered it in the liver. It has ever since attracted the attention of physiologist and pathologist. The authors give a useful résumé of the literature on the subject up to the date of their own investigations.

They have studied 79 patients suffering from a variety of diseases, divided as follows: liver affections, 15; diabetes, 15; malignant tumours, 17; kidney affections, 7; heart affections, 6; septic infection (gynæc.), 4; adiposity, 2; chronic sepsis, 4; croupous pneumonia; Graves' disease; polyserositis; tuberculosis; arthritis deformans; spontaneous gangrene; myeloid leukæmia; gastritis; arteriosclerosis, 1 each.

The method of demonstrating the glycogen in the blood is that devised by Joung and Planelles and is very suitable for clinical purposes.

Glycogen is frequently present in the formed elements of the blood, but, under pathological conditions, can be increased in the plasma.

The glycogen content of the plasma and serum is the same.

In the milder forms of hepatic disease the glycogen content of the blood is not disturbed, but is much increased in the case of destructive processes involving the liver parenchyma.

The glycogen content of the blood is much increased in diabetics.

In cardiac decompensation the glycogen content increases parallel with the degree of alteration in the liver.

In diseases that are accompanied by leucocytosis the glycogen content of the blood is moderately increased, while in leukæmia it is greatly increased.

A. G. NICHOLLS

Ueber den Glycogengehalt des Uteruskarzinoms und der atypischen Plattenepithelwucherungen in Bereich des Os externum. (On the glycogen content of carcinoma of the uterus and of squamous-celled growths in the region of the external os.) Lahm, W., *Zeitschr. f. Geburtsh. u. Gynäkol.* 93: 356, 1928.

The author has investigated the question of the glycogen content of uterine cancers of different types and at different stages. The cells in early squamous-celled epithelioma contain little or no glycogen. The amount of glycogen found increases as the cells show advancing differentiation, that is, in proportion as they approach in character the normal epithelium. In the case of cylindrical-celled cancers glycogen is present in those areas only where "caneroid" nests of squamous cells are found.

A. G. NICHOLLS

ANÆSTHESIA

Note on Spinal Anæsthesia. Pannet, C. A., *The Lancet* 2: 1194, July 6, 1929.

During life the dural sac is held fully distended so that its internal volume cannot be increased. However much fluid is withdrawn the capacity of the sac remains the same. The place of evacuated cerebrospinal fluid is taken by an increase in the size of the numerous thin-walled vessels in the spinal and cranial cavities. There are no large vessels in the cauda equina. When fluid is injected above the cauda equina its path downwards is blocked because the sac there is distended to its fullest capacity, there being no thin-walled vessels to diminish in size to make room for introduced fluid. The fluid must travel towards the cranium, and the extent to which it will do so depends on the amount injected.

The author has devised a method of administering spinal anæsthesia based upon these physical considerations, and finds it satisfactory, even in operations on the upper abdomen. He withdraws 8 c.c. of cerebrospinal fluid. To this he adds 1 c.c. of 15 per cent novocaine in distilled water. The mixture is slowly injected, the patient turned on his side, and the head of the table lowered 5° to 10°. The injection being made between the 2nd and 3rd lumbar spaces, the 3rd and 4th lumbar nerves are anæsthetized. Fifty milligrams of ephedrine are injected hypodermically immediately after the patient is turned on his back.

W. B. HOWELL

Action de l'anesthésie rachidienne sur le motilité intestinale. (Action of spinal anæsthesia on intestinal peristalsis.) Domenech, F., *La Presse Médicale* p. 66, Jan. 16, 1929.

Spinal anæsthesia causes an immediate marked increase of intestinal peristalsis in the dog. It is as if the preganglionic fibres of the splanchnic nerves were cut. The increased peristalsis can be abolished by the administration of ether, chloroform, or atropine. The absence of peristalsis observed at operation performed under chloroform or ether anæsthesia is probably due to paralysis of the vagus.

W. B. HOWELL

"For the mind depends so much on the temperament and disposition of the bodily organs that, if it is possible to find a means of rendering men wiser and cleverer than they have hitherto been, I believe that it is in medicine that it must be sought. It is true that the medicine which is now in vogue contains little of which the utility is remarkable; but without having any intention of decrying it, I am sure that there is no one, even among those who make its study

a profession, who does not confess that all that men know is almost nothing in comparison with what remains to be known; and that we could be free of an infinitude of maladies both of body and mind, and even also possibly of the infirmities of age, if we had sufficient knowledge of their causes, and of all the remedies with which nature has provided us."—Descartes: *Discourse on the Method*.

Obituaries

Dr. Frank L. McKinnon. One of the most prominent of Winnipeg surgeons, Frank Lorne McKinnon, died in the Winnipeg General Hospital on July 16th, after a short illness.

Born at Goderich, Ont., in 1879, Dr. McKinnon came west as a child with his parents, Mr. and Mrs. Charles McKinnon, who settled near Carberry, Man. Receiving his early education from the Petrel school at Carberry, Dr. McKinnon later entered the University of Manitoba, graduating in 1908 with a bachelor of arts degree. Studying medicine in the same institution, Dr. McKinnon obtained his M.D. degree in 1912. His graduation as a doctor saw him entering the Winnipeg General Hospital for two years as a house surgeon.

At the outbreak of the Great War in 1914 Dr. McKinnon enlisted with the R.A.M.C., and he was sent to Mesopotamia, where he served for four years. At the close of the war, he was decorated with the Military Cross.

A year or two after his return from the war he proceeded to Edinburgh, where he took a post-graduate course in surgery. After the completion of this course he was appointed surgeon to the Children's Hospital and Associate Gynaecologist to the Winnipeg General Hospital. He was a Fellow of the American College of Surgeons.

Always keenly interested in sport, he was a member of champion football teams of Manitoba and medical colleges, an ardent golfer and a member of the Niakwa Golf Club, and also a tennis and badminton player.

In the field of service, he was an elder first of St. Stephen's, and, later, of St. Stephen's Broadway United Church, taking an active part in the negotiations leading up to the union of the two congregations, and an active member of the Kiwanis Club.

Dr. McKinnon is survived by his widow, formerly Miss Edith Carwell, and by five brothers and two sisters; W. O. McKinnon and Simon McKinnon, of Wellwood, Man.; Oliver J. McKinnon, of Winnipeg; Alex. M. McKinnon, of Edmonton; Dr. Charles McKinnon, of Lulu Island, B.C.; Agnes Rossiter, of Edmonton, and Mrs. Thomas Richardson, of Clearwater, Man.

The funeral was held on July 18th, first from his home, 407 Wardlaw Avenue, where a private service was held, and later from St. Stephen's Broadway to Brookside Cemetery. Rev. Dr. G. A. Woodside presided and the pall-bearers were Drs. B. J. Brandson, J. D. McEachern, N. A. Warner and W. E. Campbell, A. T. Hawley, K.C., and H. Gosling.

As a man of the highest integrity, a true sportsman, and a capable surgeon upholding the highest traditions of the profession, he will be greatly missed by a wide circle of friends and acquaintances.



Dr. Frank L. McKinnon

Dr. E. E. Bryans died suddenly on July 3rd, at his residence, 160 Woodington Avenue, Toronto. He had been suffering with his heart since his return from overseas, and complaining of feeling unwell, was suddenly seized while resting on a couch. His wife discovered her husband lying on the floor. He was about to be removed to hospital when he died.

Dr. Bryans was born in Brussels, Ont., forty-nine years ago, and graduated in medicine from Trinity College, Toronto. He had practised medicine for twenty-five years, most of that time in the west. He enlisted in the Medical Corps at Winnipeg during the war, and served three years overseas as a captain. On his return from overseas he was appointed senior medical officer at the Polish Camp at Niagara-on-the-Lake. He came to Toronto five years ago, and had practised here until the day of his death.

He attended St. Barnabas' Church, and was a member of Niagara-on-the-Lake Chapter, A.F. and A.M., and St. John's Lodge, A.F. and A.M., Brussels.

Surviving are his wife, his mother and two sisters, all of Toronto.

Dr. R. E. Cooper. News was received on August 4th, at Colborne that Dr. R. E. Cooper, formerly of that district, is dead at Plymouth, Mich., as the result of a motor accident. He was born in Cramahe Township, and was a graduate of Trinity Medical College, Toronto.

Dr. George H. Cowan, a graduate of the Faculty of Medicine, University of Toronto, in 1871, and a practising physician in Napanee for half a century, died at his residence in Napanee on July 16th. For many years Dr. Cowan had been Medical Health Officer for Napanee, and also Coroner for the County of Lennox and Addington. He was born in 1848 at Princeton, Ont., where his father, Jeremiah Cowan, was one of the pioneers of Oxford County. There the last remaining member of the family, Frank Cowan, who is in his ninety-sixth year, still resides. Surviving are his widow; two daughters, Mrs. H. L. Morrison, of Ottawa, and Miss Caroline Cowan, of Boston; and one son, H. P. Cowan, of Montreal.

Dr. R. Desrochers, who formerly practised his profession in Montreal, died at St. Charles, Richelieu River, July 21, 1929. Dr. Desrochers was born on March 5, 1882, at St. Charles and was educated in the normal school in Montreal. After the completion of his preliminary studies, he entered Laval University and graduated with the M.D. degree in 1905. After graduation he practised in the Eastern Townships for eight years, coming to Montreal in 1913. Dr. Desrochers was also a good pianist, and was a member of the well known Trio Desrochers, composed of J. J. Desrochers, violinist; R. A. Desrochers, pianist, and Felix Desrochers, clarinetist.

ROSS MITCHELL

Dr. W. Henry Fox, a graduate of Toronto University, a physician in Woodlawn, Chicago, passed away at his residence, 6220 Blackstone Avenue, on July 26th. He was a son of the late Rev. Thomas Fox, and is survived by his widow, Cecilia, daughter of the Rev. S. B. Phillips of St. Catharines; one brother, Rev. John Wesley Fox; and three sisters, Miss Annie Fox of Toronto, Mrs. Albert Jacobs of Lincoln, Neb., and Mrs. Elmer Davis of Kingston.

Dr. Fox was a member of the Chicago Medical Association, the Chicago Medical Society, and the Masonic Order, of Jackson Park A.F. and A.M. The funeral took place from the Stone Funeral Home on July 30th to the family plot in Mount Pleasant Cemetery.

Dr. Byron Field, a highly regarded medical practitioner, and an old resident of the district, died at his home in Pickering, Ont., on August 6th, in his seventy-eighth year.

Dr. Field first practised in Pickering thirty-five years ago, shortly after he graduated from the University of Toronto. From Pickering he went to Toronto, and established his practice at Woolcott Street and Spadina Avenue. After working at his profession in Toronto for fifteen years, he was made the surgeon for the T & N.O. Railway in Northern Ontario at the time of its construction, and remained in Northern Ontario until his retirement sixteen years ago, when he returned to Pickering.

Dr. Field was born in Darlington Township, and received his high school education at Whitby. He was a member of the Masonic Order, and was a Presbyterian. Surviving are his widow, Mrs. Mildred Field; and one son, Dr. Jordon Field of St. Clair Avenue West, Toronto.

Dr. René Fortier, professor in Laval University, died at his home in Quebec, on August 9th, after a long illness. Georges-Émile-René Fortier was born at Ste. Marie de Beauce on August 4, 1866, and was, therefore, at the beginning of his sixty-fourth year.

His earlier studies were pursued at the College of Lévis and the Quebec Seminary. He received his degree in medicine from Laval University in 1890. After graduation, Dr. Fortier spent two years in Paris in the study of paediatrics. In 1894 he was appointed Professor of Hygiene and Paediatrics in Laval University. Among his many activities it may be noted that he became physician to the Hôtel-Dieu in 1901, and to the Crèche Saint-Vincent de Paul in 1905; he was one of the founders of the Hôpital de l'Enfant Jésus, and, from its foundation in 1927, was chief of the paediatric service of the Hôpital du Saint-Sacrement.

Dr. Fortier married in 1896 Mlle. Alice de la Bruère, daughter of the late Hon. Pierre Boucher de la Bruère, former President of the Legislative Council of Quebec and Superintendent of Public Instruction. He is survived by his widow and six children.

Dr. Arthur Rousseau, Dean of the Faculty of Medicine of Laval University, has pronounced the following eulogy:

"Dr. Fortier was the model practitioner, extremely well informed on all subjects relating to his specialty, very devoted to his patients; he did honour to his profession. Assuredly a great moral personality disappeared at his death."

William Graham, M.D., formerly of Brussels, Ont., died at his home, 15 Alhambra Avenue, Toronto, on July 10th, in his 91st year. He was born in 1838, at Edinburgh, Scotland, and came to Canada at the age of twelve. He settled in Huron County, near Clinton; was educated at Goderich grammar school and Toronto

University, graduating in medicine. He practised in Brussels for 50 years. He was one of the oldtime family physicians and a leading figure in the community. Surviving are one brother in Scotland; a sister in San Diego, Cal.; a nephew, in Stratford, Ont.; and a niece, Miss Florence Foss, of Toronto.

Dr. U. A. Hart, the oldest medical practitioner of Barrie, died on July 12th. Born and educated at Dalston, Ont., near Barrie, the deceased graduated from Trinity Medical College, Toronto, in 1896, and became a licentiate of the Royal College of Physicians and Surgeons, Glasgow, Scotland.

He first practised in Sault Ste. Marie, Ont., and for over twenty years in Barrie. He leaves a widow and two young children; two sisters; three brothers, O. G., of Barrie; Sidney, of Weyburn; and Dr. Fred. Hart, Winnipeg.

Dr. Peter Douglas Van Kleeck, a leading medical practitioner for very many years in Armstrong, prominent also in the encouragement of local sport and in many fields of social activity, and late Liberal candidate for the Provincial House, passed away on Sunday, July 28th, at the Mayo Clinic, Rochester, Minn., whither he had gone for treatment only two weeks previously.

Dr. Van Kleeck came to Armstrong about thirty years ago, after graduating at Toronto University, and has practised in that city ever since.

He came of United Empire Loyalist stock, his ancestors having come to Ontario after the war of the American Revolution, and settled at what is now known as Vankleek Hill.

In 1914, he married Florence Alice Groves, daughter of Mr. and Mrs. Ernest Groves of Armstrong, and is survived by his widow and five children, Douglas, Barbara, Francis, Winifred, and Bruce. In addition to these, he also leaves the following sisters; Mrs. (Dr.) Kingston of Grand Forks, B.C., wife of the local member for that Riding; Mrs. Rollins, of Madoc, Ont.; Mrs. Macdonald, of Vancouver; and Miss Van Kleeck, of Edmonton, Alta. His only brother, Bruce, was killed in France in the autumn of 1918.

Dr. Van Kleeck had enjoyed for many years a very large practice in Armstrong and the vicinity, and also, a consulting practice in the whole North of the Okanagan valley, and had developed into a surgeon of more than local repute.

His funeral, which took place from his home on Rosedale Avenue, on Saturday, August 3rd, attested to the esteem in which he was held, being one of the largest ever held in the Okanagan. The business houses in Armstrong were closed until 1 p.m. and flags were flying at half-mast on many buildings. The funeral arrangements were in charge of the Masons, of which he was a Past D.D.G.M.

H. W. KEITH

Dr. W. A. Lawrence. The third break in the Lawrence family of eight brothers, of whom Russell Lawrence of Bronte is a member, occurred in the death of Dr. William Allan Lawrence, aged 66, at Ithaca, N.Y. The other two brothers who died since last February, were Dr. Thomas Howard Lawrence, Mexico, and Daniel, the eldest, at Clarkson.

Son of Mr. and Mrs. Ferris Lawrence, Dr. W. A. Lawrence was born at Sheridan in 1863. After graduating from high and model schools he taught school at Fisher's Corners and in Oxford county. Later he took a medical course at Trinity College, Toronto, and graduated in 1903.

Dr. Lawrence was lecturer for a time in anatomy

at Cornell University and later began practice at Ithaca, N.Y. He was Very Worthy Physician and Past Worthy Secretary of the Fraternal Order of Eagles; a member of the Elks, Moose, Oddfellows, Knights Pythias, the Eureka Conclave and the Ithaca Gun club. Gifted in music, he could play practically any instrument.

Surviving are: his widow, two sons, Robert and William; one daughter Mary; five brothers, Orange and Nelson, Sheridan; Cyrus, of Meskanaw, Sask.; John, of Toronto, and Russell, of Bronte. (July 31st).

Dr. A. S. Martin, aged 90, formerly of Port Arthur, and a resident of Winnipeg for the past ten years, died at his home here on July 7th. Previous to the war he had practised in Lindsay. He was born in Toronto. Mrs. Martin and four children, Mrs. L. H. McBride, Fred. and Arthur, of Port Arthur, and Bert, of Winnipeg, survive.

Dr. O. F. Mercier, one of the best known surgeons in Canada and surgeon-in-chief of the Notre Dame Hospital, died on August 2nd, at the age of 62 after an attack of angina pectoris. Born in Montreal on December 1, 1867, Dr. Mercier was educated at the Montreal and St. Mary Colleges and took his degree in medicine from Laval University of Montreal. At the sudden end of his successful career he was professor of clinical surgery at the University of Montreal, President of the Medical Union, President of the Surgical Society, member of the American College of Surgeons, member of the Surgical Society of Paris, and President of the Industrial Medical Society.

Dr. Thomas Harvey Robinson, aged 75 years, for many years an outstanding figure in the life of Kleinburg and district, passed away on July 13th.

Dr. Robinson was a descendant of pioneer stock, his parents having emigrated from Ireland about one hundred years ago. They settled at Nobleton, where the doctor was born. Part of his early life was spent teaching in the public schools. He later studied medicine and graduated from the Toronto Medical College in 1883, when he started practice at Kleinburg, where he continued until his death. The deceased had been medical health officer and coroner for the township of Vaughan for many years. His wife predeceased him some years ago, and surviving are one son and two daughters. They are Dr. Howard Robinson, Milwaukee, Wis.; Dr. Helen Robinson, Toronto; and Miss Charlotte Robinson, also of Toronto. Besides, there is one surviving brother, George Robinson, Toronto.

Dr. Allison Turner, a general practitioner in Dutton for the past nine years, died in Queen Alexandra Sanitarium, London, on July 16th, following an extended illness, aged about 45 years. Dr. Turner was born in Southwold Township and attended the St. Thomas Collegiate Institute. He taught school at Lawrence Station for a number of years before entering the University of Western Ontario, where he graduated in medicine in 1904. He practised in Lawrence Station for several years before going to Dutton. He was a prominent member of the Masonic order and also of the I.O.O.F. He is survived by his widow; a daughter, Gertrude; and four brothers and a sister.

News Items

GREAT BRITAIN

The London School of Hygiene and Tropical Medicine

The great building which H.R.H. the Prince of Wales opened on July 18th in the presence of a distinguished company is the outcome of the recommendations made in 1921 by the Committee, under the presidency of Lord Athlone, appointed by the Minister of Health of that day, Sir Alfred Mond, now Lord Melchett. This Committee, finding that the post-graduate teaching of Public Health in London was inadequate and uneconomic, advocated the establishment of a central institution, affiliated to the University of London, wherein full provision should be made for instruction in all branches of preventive medicine.

The chief difficulty in the way of carrying this recommendation into effect was financial. The country, hard hit by the war, was staggering beneath a burden of debt and its trade and industries had not recovered from the conditions which had convulsed Europe, and indeed the whole world. Happily the Trustees of the Rockefeller Foundation in New York came to the rescue and this country gratefully acknowledges the timely assistance which that wonderful and wealthy Foundation generously extended to it in time of need. Impressed by the results of their inquiries in many lands, the Trustees had reached the conclusion that, if the gospel of hygiene, a gospel of hope and comfort, a gospel of vital importance to mankind, was to be adequately served, a great teaching centre of the type envisaged by the Athlone Committee was a necessity. Furthermore, they recognized the peculiar advantages which London presented as a site for such a school, in consequence of its traditions in public health work and organization, its medical associations, its prestige

as a world capital, its position as a huge sea-port, its general relations to commerce and industry, the facilities it presents for studying well-nigh every type of hygienic problem, and accordingly they offered the Ministry of Health a sum of £460,000 towards the attainment of the project. This large sum was to be expended on the purchase of a site and on the building and equipment of an institution of the type required. The only accompanying condition was that the British Government should contribute adequately towards its maintenance.

As is well known, Mr. Joseph Chamberlain, when Colonial Secretary, founded in 1899, at the instance of Sir Patrick Manson, the father of modern tropical medicine, a school for the study of diseases of the tropics. This, the London School of Tropical Medicine, which for many years occupied premises at the Albert Docks and after the war removed to Endsleigh Gardens, was, from its commencement, under the aegis of the Seamen's Hospital Society, and had carried out most excellent and useful work and been of great service to our Colonial possessions. Negotiations with the Society led to the union of the new School of Hygiene with the London School of Tropical Medicine and there was thus formed the London School of Hygiene and Tropical Medicine, which was incorporated by Royal Charter on August 1, 1924.

The School, therefore, is charged with the duty of continuing and enlarging the instruction given in the old London School of Tropical Medicine and of providing facilities for research on the lines which have made that School famous the world over.

The type of building required for such a diversity of interests was the subject of long and careful con-

sideration and, when preliminary plans had been prepared and details worked out, a limited number of architects with experience in laboratory construction was invited to submit designs. The successful design was submitted by Mr. P. Morley Horder, and Mr. Verner O. Rees, A.R.I.B.A., in association with Mr. Horder, has carried through successfully the execution of the design so submitted.

Particular attention has been directed to the library and museum. The former will eventually be a large and representative Library of Hygiene, using this word in its widest sense, and how wide that is only those who have made the study of preventive medicine their life work can fully appreciate. The Museum, of a comprehensive and graphic type, consists of three parts, namely, sanitary engineering, hygiene in the general sense and tropical medicine. It will be open to the public and cannot fail to become a centre of propaganda and a guide to methods of safeguarding and improving the health of the people, both at home and overseas.

The School, as now constituted, has the following Divisions:

1. **Public Health.** This connotes a very large number of subjects. The term includes not only much that concerns environmental hygiene and the control of infectious diseases but all that relates to the health and welfare of the individual. In this Division there is a section devoted to the physiology of hygiene. In this and in other directions the activities of the public health division will be brought closely into contact with industrial problems and should play a notable part in assisting both the employer of labour and the employed.

2. **Epidemiology and Vital Statistics.** The two subjects are closely linked and the division itself stands in close relationship to all the other divisions and should play a great part in training students to become careful observers and recorders, the while it continues to cast light in dark places and to subject the results of research work to the acid test of statistical accuracy.

3. **Bacteriology and Immunology.** This, a most progressive division, has already, in temporary quarters, been doing fine work in training men and women who have decided to follow bacteriological careers, both at home and abroad.

4. **Biochemistry, including a Department of Chemistry as applied to Hygiene.** It is often said that "the future lies with the biochemist," and there can be no doubt that many of the most important problems in preventive medicine can only be solved by his skilled help. The biochemical work will in the main be of a research nature but the Department of Chemistry, while not ignoring research, will be largely concerned with training the public health student in the analysis of water, sewage and food, in the examination of disinfectants and in the relations which chemistry bears to industry so far as hygiene is concerned.

5. **Medical Zoology.** This large division, embracing the departments of protozoology, helminthology and entomology, is, apart from the prosecution of research, chiefly concerned with the training of medical men and women destined for the tropics. At the same time instruction will be afforded students proceeding

to degrees and diplomas in public health, to those attending the School at the instance of the League of Nations for the study of malaria, and to others professing one or more of the three subjects above mentioned. An aquarium and large insectarium are features in the equipment of this division.

6. **Tropical Medicine and Tropical Hygiene.** This embraces the all-important clinical work in diseases of the tropics for which facilities are afforded by the Hospital for Tropical Diseases, Endsleigh Gardens, now Gordon Street, which, under the auspices of the Seamen's Hospital Society, will continue in close touch with the School.

Associated with this clinical work is the study of applied pathology, as distinct from the pathology of protozoal and helminthic infections. It is concerned largely with questions of technique and is of the utmost importance to the physician practising in the tropics.

Tropical hygiene figures in this division and its study indicates the modifications which the climate and conditions of countries in the torrid zone impose upon the pursuit of the hygienic ideal.

Such is the constitution of the School for teaching and research work. Its staff being in contact with other official research organisations, exceptional opportunities will be forthcoming whereby students may acquire experience of the way in which large scale investigations of public health problems are planned and conducted, while its association with officials of the public health service will ensure adequate practical instruction in field work, both urban and rural.

It possesses an entomological field station at Farnham Royal and, thanks to the Ministry of Agriculture, an Institute of Agricultural Parasitology at St. Albans, which provides opportunities and material for teaching and research work in medical zoology.

On the tropical side it co-operates with the Government of Southern Rhodesia in the work of a field station at Salisbury, and frequently sends members of its staff abroad for purposes of study and research. In its new home it will look forward confidently, provided ample funds for maintenance are forthcoming, to an extension of its work and to the full attainment of the great purpose for which it has been brought into being and which may be expressed shortly, simply, yet adequately, in four words, "the Welfare of Mankind."

The Fifteenth Annual Conference of The National Association for the Prevention of Tuberculosis will be held at Newcastle-upon-Tyne on October 10th, 11th and 12th, 1929. Further particulars may be obtained from the Secretary, 1, Gordon Square, London, W.C.1.

The Morison Lecture

It is announced that Dr. S. A. Kinnier Wilson (London) has been appointed Morison Lecturer for 1930, at the Royal College of Physicians of Edinburgh.

Gifts from the late Lord Revelstoke

The late Lord Revelstoke, in addition to his gift of £100,000 to King Edward's Hospital Fund for London, of which he was treasurer, has left £50,000 to Guy's Hospital, and £25,000 to St. Mary's Hospital Medical School.

Seemingly, credit is due to a number of Halifax physicians for assuring at least the immediate future of the Crousetown Fish Club. The president of this important organization, who has guided its affairs with singular acceptance for some years, was bent upon relief from the great responsibility imposed by his high office, but the impassioned appeals of Drs. E. V. Hogan, H. K. MacDonald, and S. R. Johnston were successful in securing a distinctive reconsideration, and the membership of the club is temporarily relieved of the dread of serving under a new and untried president. It is related that the veteran president indicated to at least one of the medical members that he would brook no interference with his prerogatives as long as he remains in office.

The purchase of additional property for the site of the new Halifax Infirmary permits of considerable modification of the plans which were prepared for the buildings. This will occasion some delay in the commencement of operations, but this is of little consequence in comparison with the greater convenience which is expected to result from the revision of plans.

Construction work on an addition to the Payzant Memorial Hospital, Windsor, is now well advanced. When it is completed, the accommodation will be almost doubled.

Those who advocate making Nova Scotia a restricted area in respect of bovine tuberculosis have found many who do not see eye to eye with them. Before and during the recent provincial election the matter, very unfortunately, we think, was made a political issue. This did not favour an entirely reasonable attitude by either pros or cons. Some opponents of the scheme refuse to allow their cattle to be submitted to a second tuberculin test, and it is said that legal action is to be taken against them. While primarily intended for the improvement of stock, the effort to eliminate tuberculosis from herds of cattle interests those of our profession who wish to note what influence the reduction of bovine tuberculosis may have on the incidence of tuberculosis of bovine type in the human.

A fine portrait of Dr. John Stewart has been placed, by an admiring friend, in the Sutherland Memorial Hospital, Pictou. Dr. Stewart practised in Pictou for many years and was active in creating a sentiment in favour of the establishment of a hospital in that town.

Dr. H. A. MacKeen has been appointed Assistant

Professor of Bacteriology at Dalhousie University, to take duty before the opening of the next session. Dr. MacKeen is a son of the late Dr. R. A. H. MacKeen, of Glace Bay, whose memory is held in affectionate esteem by all who knew him. Graduating at McGill in 1924, the new professor has since followed work in pathology at the Montreal General Hospital and the Boston City Hospital, and has been on the teaching staffs of the medical schools of McGill and Tufts Universities.

Dr. J. G. D. Campbell has been appointed to the medical staff of the Children's Hospital, Halifax.

Drs. J. R. Corston and G. R. Burns have been appointed assistant physicians to the Victoria General Hospital, Halifax, and Dr. W. G. Colwell has been appointed assistant gynaecologist to the same hospital.

Recent defectors from bachelordom include Drs. A. E. Doull, Jr., Halifax; E. W. MacDonald, Reserve; P. L. Oxley, Northport; J. C. Wickwire, Liverpool; S. Marcus, New Germany; and W. G. Colwell, Halifax.

The Town Council of North Sydney has endorsed the proposal of the Board of Health of that town to immunize school children against diphtheria.

The will of the late A. Milne Fraser, of Halifax, provides for a bequest of \$30,000.00 towards the cost of a hospital at Kentville. Some months ago Mr. G. E. Calkin, of Kentville, gave a property valued at approximately \$40,000.00 for hospital purposes. A Commission has been formed which will endeavour to meet the conditions of the Fraser bequest and to assure the erection of a hospital within a short time.

Mr. C. W. Startup, a graduate of the University of Aberdeen, has been appointed assistant in physiology at Dalhousie University. Part of Mr. Startup's training was obtained under Professor J. J. R. MacLeod, recently of the University of Toronto, but now in charge of the department of physiology at Aberdeen.

All sixteen candidates who wrote the June examinations of the Medical Council of Canada at Halifax were successful in passing in all subjects. One candidate is a graduate of McGill; the others are Dalhousie graduates.

Dr. J. W. MacLean, of North Sydney, has returned from a much enjoyed trip to the mother country.
W. H. HATTIE

NEW BRUNSWICK

The Nesbit wing of the Saint John County Hospital is rapidly progressing. In this connection, several new expenditures have been necessitated, including new sun porches, new corridors, and a film storage building separate from the main building. The necessity for the new children's wing, provided by Mr. Nesbit, is evidenced by the waiting list of young patients desirous of treatment at the institution.

At the last meeting of the Saint John Ambulance Association, a handsomely illuminated vote of thanks, passed by the Grand Priory of London, was presented to Dr. G. G. Melvin, Medical Health Officer of New Brunswick. Dr. Melvin's support and aid has materially assisted the Saint John Ambulance Association's work in the province.

The newly appointed house-staff of the General

Public Hospital, Saint John, comprises Dr. O. McDonald (McGill), Dr. A. L. Donovan (McGill), Dr. Irene V. Allen (Dalhousie), Dr. J. P. McInerney (McGill), and Dr. A. L. Winsor (Queen's).

Dr. Donald Porter, lately of Minto, has begun his practice in Saint John. He will specialize in pædiatrics.

Dr. Joseph Tanzman, a recent interne at the General Public Hospital, has started practice in Saint John.

Dr. W. F. Roberts has associated with himself in practice Dr. D. W. Buchanan.

Dr. O. B. Evans sailed this month to pursue surgical studies at Edinburgh.

A. STANLEY KIRKLAND

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A campaign to provide funds for the erection of a Jewish General and Maternity Hospital containing at least 150 beds will be held in Montreal from September 22nd to 30th. The minimum sought is \$600,000, but the committee in charge of organization confidently expects that a much larger sum will be realized. This decision to add to the hospital accommodation of the city has been made as a result of an exhaustive survey of the hospital situation conducted by members of the Jewish community. A deplorable shortage was revealed, and the provisional committee was convinced that the Jewish citizens would do something toward ameliorating the prevailing conditions. When built and equipped the proposed hospital will be open for all citizens without consideration of race or religion. The existing Jewish Maternity Hospital, temporarily closed, will be merged with the new institution. No site for the Jewish Hospital has been chosen, but several are under consideration. The latest and most modern ideas of hospital service and interior arrangements will be incorporated into the plans. For the purposes of the campaign, the metropolitan and outlying districts have been divided into twenty-five zones with a district chairman, zone chairman, and captains in each unit. Approximately twelve hundred active solicitors will be enlisted to canvass for funds. Every town and city in the Province of Quebec will be canvassed and the Jewish residents given an opportunity to co-operate.

Dr. Casey A. Wood, whose professional career began in Montreal, is residing in London for two years. He is preparing a catalogue, with notes, for the works on vertebræ zoology and general biology in the

libraries of McGill University, in all about 10,000 titles.

The efficacy of the use of serum in the treatment and cure of infantile paralysis has recently been emphasized by Dr. C. F. Martin, Dean of the Medical Faculty at McGill University. Dean Martin referred specifically to the recent epidemic in Winnipeg, when the serum proved to be of inestimable value. He says: "The full value of medical science reaches comparatively only a few people. Large numbers of individuals still suffer and die from conditions which can and should be prevented. It is, of course, self-evident that it is of no practical value for us to know, as we do for example, that the blood serum from convalescent infantile paralysis cases will prevent the occurrence of paralysis or lessen its severity in new cases, if given in time, unless we make use of such knowledge. Experience has shown the value of convalescent serum. The results in Winnipeg, last year, gave striking confirmation. Among those treated with convalescent serum, there were no deaths; 93 per cent made a complete recovery; 7 per cent had some paralysis. The group who did not receive serum showed 11 per cent of deaths; 63 per cent with paralysis; and only 26 per cent made a complete recovery. No one can say when we may need convalescent serum, but we would certainly be well advised to be prepared if the need should unfortunately arise. The serum must be used before the paralysis develops. We cannot wait to collect convalescent blood until cases appear, because this procedure takes too long. We must have the serum ready for the eventuality." A few cases of poliomyelitis have made their appearance in Montreal and steps are being taken to have in hand a supply of the necessary immune serum.

GEORGE HALL

MANITOBA

In an offer communicated to the provincial government the sisters of St. Boniface Hospital propose to erect a tuberculosis sanatorium with a present capacity of 125 beds. The hospital is prepared to increase the new institution to 200 beds. Plans for the installation of a radium emanation plant are also being considered. The offer of a new sanatorium is made possible by the generous offer of a wealthy lady, formerly a resident of Manitoba. It is understood that her gift is made on the sole condition that it be used for the construction of a sanatorium for tuberculous patients. The offer is being considered by the provincial government.

Two Winnipeg physicians, Dr. Bruce Chown and Dr. Jos. L. Jackson, have recently received awards from the Banting Research Foundation to enable them

to carry on research work in connection with pyelonephritis in children and a histological study of the thyroid gland respectively. Dr. Bruce Chown is pathologist to the Children's Hospital and physician in charge of out-patient tuberculosis and cardiac clinics, while Dr. Jackson is Lecturer in Anatomy in the Medical School.

The staff of the Manitoba Sanatorium, Ninette, are conducting clinics at various points throughout the province.

Dr. W. Harvey Smith of Winnipeg, President-Elect of the British Medical Association, was present at the annual meeting of the Association in Manchester.

ROSS MITCHELL

SASKATCHEWAN

A post-graduate team, consisting of Dr. J. A. Nutter, Clinical Professor of Orthopaedic Surgery, McGill University, and Dr. H. E. MacDermot, Demonstrator in Medicine, McGill University, and Director of the Chest Clinic, Montreal General Hospital, toured Saskatchewan in July. In spite of the fact that the meetings were held in the holiday season they were well attended.

Tenders for a new nurses' home at the Regina General Hospital have been let. The new home is to

accommodate 228 nurses and will be finished in the spring.

When the authorities of the Regina Exhibition learned of the birth of an Indian baby at the Indian encampment on the Fair grounds they notified the V.O.N. nurse who found a healthy infant of seven pounds. The red calico rag that was used by the old Indian woman obstetrician as a cord tie was changed for something more aseptic. The Regina Branch of the V.O.N. gave the child a complete layette.

A AND D

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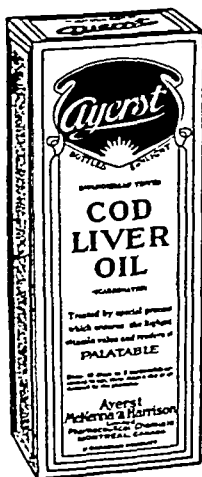
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In many cases where Vitamin A may be particularly indicated, Vitamin D, with its specific influence on Calcium and Phosphorus metabolism is also highly desirable.



VITAMIN D

Generally accepted in the prevention and treatment of rickets. Widely prescribed during pregnancy and lactation to improve Calcium and Phosphorus metabolism. Also indicated in neurasthenia and fatigue where an upset may have occurred in the balance between the sedative and stimulating tissue bases, due to a diminution of the sedative calcium factor.

In all these conditions where Vitamin D is particularly indicated, it is now generally accepted that the resistance must also be increased by an adequate supply of Vitamin A.

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Note: In cases where patients may be unable to take a pure Cod Liver Oil without discomfort, Ayerst "Calcium A" capsules will be found useful in overcoming the difficulty. Each capsule contains a small quantity of organically combined Calcium and Phosphorus together with the Total Vitamin content of approximately one teaspoonful of Ayerst biologically-tested Cod Liver Oil in the form of a concentrate. These are supplied in packages of 100 capsules each, ready for dispensing.

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Dr. John G. Grant formerly with the Pædiatries Department of Strong Memorial Hospital, Rochester, N.Y., has opened an office in Regina. His practice is limited to diseases of infants and children.

Dr. Beattie Martin since his return from Europe is limiting his practice to orthopædic surgery.

LILLIAN A. CHASE

ALBERTA

The question has been asked; when is a patient an indigent? This is a moot point which requires interpretation by judicial enquiry. To the municipal officers of many rural districts, the words "indigent" and "pauper" are synonymous. Yet, even though a man may have no crop or be earning half wages to keep a family, since he has an equity in a farm or a house, he is not an indigent.

Recently a country physician was called eighteen miles to attend a maternity case, but owing to the poverty of the family no bill was rendered. Later one for \$25.00 was sent to the municipality. The doctor had paid \$9.00 for his transportation. The municipality refused to pay, as the man had bought a farm on crop payments, paying \$25.00 in cash to close the transaction. This year he has fourteen acres in wheat, half of which goes in the purchase price of the farm. It was quite evident that this man, who was an invalid and crippled for life, was without available means to settle the doctor's bill, yet the municipality declined to meet the account. The doctor in question is considering the advisability of bringing suit, in order that he may establish the debatable point as to what is the meaning of the term indigent. Until last year the physicians of Alberta rendered free services to patients which if estimated at reasonable rates would have amounted to more than the sum total of the entire health budget of the Alberta Government.

A large attendance is expected at the annual meeting of the Alberta Medical Association to be held in Lethbridge, on September 17th, 18th and 19th. Besides those who will come from Montreal and Toronto under the Canadian Medical Association's grant for post-graduate work and the personnel of the list of lecturers which has been referred to in the June number of the *Journal*, a number of local men will also contribute to the program.

A symposium on "Artificial Immunity in Tuberculosis" has been arranged and Professors A. C. Rankin, J. J. Ower, H. M. Vango, R. M. Shaw, all of the University of Alberta, will take part in the discussion.

Extensive additions are being made to the university Hospital and to the Royal Alexandra Hospital, Edmonton, which will give upwards of one thousand beds for the four hospitals in this city.

Dr. G. E. Learmonth has returned to Calgary, having spent several weeks visiting hospitals in Montreal and New York.

Dr. F. C. Clark, who for several years prior to the war practised in Calgary, is once more with us, we are pleased to state. Following the war he practised in the West Indies.

Dr. J. W. Auld has returned from Philadelphia, where he spent several weeks in genito-urinary post-graduate work.

Mention has been made in a recent number of this *Journal*, regarding the appointment by the Department of Health of this province of women physicians to undertake medical practice in outlying districts. One of the first to be appointed is Dr. Helen O'Brien, who will look after the physical welfare of the inhabitants in the district of Lac la Biche. A second appointment has been made in the person of Dr. Mary Percy, who has been placed at Notikewin in the Peace River District. Dr. Percy came from Great Britain under special arrangements with the Department of Health.

Dr. Ford Tallmann of the staff of the Provincial Mental Hospital at Ponoka has been granted leave of absence for post-graduate work in New York City. He will spend two years there in special studies.

Dr. J. C. McKie, of Wainfleet, Ont., has applied for registration in Alberta and, in the meantime, before deciding on a location, is acting as locum tenens for Dr. Worthington at Canmore.

Dr. E. E. Rogers of Redcliff has disposed of his practice to Dr. A. E. Ward of the University Hospital, Edmonton. Dr. Rogers will practise in British Columbia.

Group practice is undoubtedly growing in Alberta. During recent months four different groups of physicians and surgeons have increased their numbers. There is one aggregate of five doctors, one of six, and still another of eight.

Dr. Samuel Morris, formerly of Brule, has returned from post-graduate work in New York and other centres. He has joined the Calgary Associates Clinic where he will devote himself to physiotherapy.

Among those who have recently registered with the College of Physicians and Surgeons are the following: Drs. A. C. McGugan, J. G. McKie, W. C. Campbell, R. K. Start, V. L. Annett, H. F. P. Grafton, H. R. Christie and Margaret Owens.

G. E. LEARMONTH

BRITISH COLUMBIA

A new branch of the British Columbia Medical Association has just been organized with headquarters in Prince George. The new organization will be known as the Cariboo Medical Association, and commences its activities with Dr. E. J. Lyon, Prince George, as President; Dr. Gerald Baker, Quesnel, Vice-president; Dr. C. Ewert, Prince George, Secretary, and Dr. J. T. Steele, Ciscome, and Dr. H. S. Trefry, Prince George, members of the executive.

The extra-mural post-graduate tour of the province, under the auspices of the British Columbia Medical Association, made possible by the generosity of the Sun Life Assurance Company, visited points in the Okanagan and Kootenay from June 19th to June 24th, when Dr. Norman B. Gwyn, of Toronto, spoke on "Rheumatic fever and the present day views as to its etiology"; "Anæmia and blood disease"; "Coronary thrombosis and angina"; and "Encephalitis."

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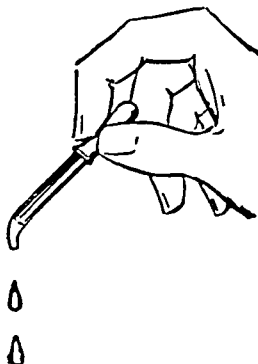
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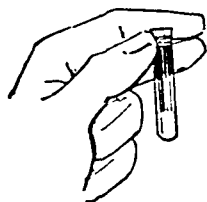
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Sept. 17th

- 9-10 a.m. The Diagnosis of Tuberculosis of the Chest
Dr. J. H. Elliott.
- 10-11 " Relation of the Heart to General Disease
Dr. H. McPhedran.
- 11-12 " Jaundice
Dr. Julian Loudon.

Sept. 18th

- 9-10 a.m. Duodenal and Gastric Ulcer
Dr. A. J. MacKenzie.
- 10-11 " Skin Diseases
Dr. F. C. Harrison.
- 11-12 " Hypertension
Dr. Hagerman.

12-1 p.m. Anæmia

Sept. 19th

- 9-10 a.m. Duodenal and Gastric Ulcer
Dr. A. J. MacKenzie.
- 10-11 " Treatment of Tuberculosis of the Chest
Dr. J. H. Elliott.
- 11-12 " The Non-Tuberculous Chest
Dr. Broughton.
- 12-1 p.m. Myocarditis
Dr. McPhedran.

Sept. 20th

- 9-10 a.m. Allergy-Asthma, etc.
Dr. A. E. Broughton.
- 10-11 " Goitre
Dr. D'Arcy Prendergast.
- 11-12 " Epilepsy
Dr. W. B. Edmonds.
- 12-1 p.m. Bronchitis
Dr. R. T. Smylie.

At each lecture cases will be demonstrated as much as possible. Each afternoon a great many cases

will be shown throughout the wards and all new methods of treatment will be demonstrated. The hospital, of course, will be open to medical visitors. There will be no charge.

All who desire to take this course should communicate with Dr. W. B. Edmonds, Medical Arts Building, St. George and Bloor Streets, as soon as possible.

Experiments on Animals

The antivivisection campaign started some years ago in Belgium has culminated in the adoption by the legislature of the following proposal for the protection of animals: "Vivisection experiments carried out for the purpose of research or demonstration shall take place only in university laboratories, or in laboratories of similar status, under the control of the responsible director, and, with prescribed exceptions, only on anesthetized animals." Approval of such laboratories will be conferred by royal decree.

The League Against Cancer (France)

The French League against Cancer announce that donors have placed at its disposal two prizes of 100,000 francs each for the encouragement of research on cancer. Further information can be obtained from La Ligue Contre le Cancer, 2 Avenue Marceau, Paris.

E. F. W. Pflüger

The centenary of the birth of the famous physiologist Eduard Friedrich Wilhelm Pflüger, the founder of *Pflüger's Archiv*, who died in 1910, was celebrated on June 7th at Bonn, where he was professor for fifty years.

Book Reviews

Diseases of Children; first edition edited by Sir Archibald E. Garrod, K.C.M.G., F.R.C.P., F.R.S., the late Frederick E. Batten, M.D., M.A., F.R.C.P., and Hugh Thursfield, D.M., M.A., F.R.C.P. Second edition, edited by Hugh Thursfield, D.M. (Oxon), M.A., F.R.C.P., Physician, Hospital for Sick Children, Great Ormond Street; and Physician, St. Bartholomew's Hospital, and by Donald Paterson, M.D. (Edin.), F.R.C.P., Physician to Out-Patients, Hospital for Sick Children, Great Ormond Street, Physician in charge of Diseases of Children, Westminster Hospital.

Toronto, The Macmillan Company of Canada; London, Edward Arnold & Co., 1929.

The Canadian profession will, we are sure, welcome a new edition of this English treatise on the Diseases of Children to the pages of which 37 of the leading pædiatrists in Great Britain have contributed; we note also that the majority of the contributors are actively connected with the Hospital for Sick Children, Great Ormond Street; a hospital whose reputation for research has stood high for nearly a century.

The scope of this volume of 1,100 pages is extensive, and includes the description and treatment of all ailments of infancy and childhood. It is written in excellent diction, so that reading is a pleasant task.

The volume opens with two introductory chapters. The first treats of heredity and the influence of the germ-plasm and Mendelian laws on the development and characteristics of the new living being. In the second, the writer discusses the theories of acquired and natural immunity, and the application of its known principles to the prophylaxis of disease. This chapter includes also rules for the administration of sera and the transfusion of blood.

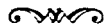
The subject of infant feeding and its occasional

difficulties, together with the food requirements of the growing child, are fully dealt with in the first chapter by Dr. Edmund Cantley and Dr. Donald Paterson. The chapter on diseases of nutrition, written by Dr. Leonard Parsons of Birmingham, and well illustrated, treats of the various types of infantile atrophy, tetany, and of rickets in all its phases. Attention is called to late rickets manifesting itself chiefly in bony deformities of the knees and legs and associated with celiac disease and renal infantilism. The chapters on infantile scurvy and on the several forms of œdema met with in childhood are from the able pen of Dr. G. F. Still. Diseases of the alimentary system are discussed by the editors in a series of sub-chapters. In this section Mr. A. T. Pitts presents an interesting article on oral hygiene and the defects met with in childhood in the teeth and jaws; following this the surgical treatment of cleft palate and hare-lip is fully dealt with by Mr. H. D. Gillies, plastic surgeon to the Ministry of Pensions Hospital, Rochampton.

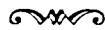
Diseases of the naso-pharynx and diseases of the respiratory system are clearly described and the most modern views in treatment are inculcated. In the chapter on diseases of the heart the readers are presented with a full and practical paper by Dr. George Sutherland. After a detailed consideration of the three important systems in the heart, the genetic or conducting system, the muscular contractile system, and the valvular system, he treats his subject from its clinical aspect, and describes conditions met with under the following sub-heads: subjective symptoms in heart disease; circulatory disturbances; acute affections of the heart; chronic heart disorders; the heart in acute infections; prognosis and treatment in its various disorders; congenital heart disease; diseases of the vessels; and Raynaud's disease. The chapter on

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diseases of the hæmopoietic and lymphatic system by Dr. Thursfield presents the reader with a clear picture in excellent diction of a somewhat difficult subject. Sir Hector Cameron's article on functional diseases of the nervous system is ably presented and is one of the most important essays in the volume, and should be read by every member of the profession who has to deal with nervous conditions in children. Dr. T. F. Poynton writes the article on rheumatism and chorea. The chapters on infectious disease are clearly presented and well up to date both in prophylaxis and treatment.

We have read this volume with much pleasure. In our review we have only referred to a few of the more important chapters, but in all, the text is everywhere up to date. The illustrations are original and representative, and the type is very readable. The book is cordially recommended to our readers.

A. D. BLACKADER

Arthritis and Rheumatoid Conditions—Their Nature and Treatment. Ralph Pemberton, M.S., M.D., Physician to the Presbyterian Hospital and Associate Professor of Medicine in the Post-Graduate School, University of Pennsylvania. 354 pp., 42 engravings. Lea and Febiger, Philadelphia, 1929.

The author, who has made an intensive clinical and laboratory study of arthritis for the past fifteen years and has written articles on his work and observations in journals and text-books, presents in the compass of a monograph the results of a long series of observations. He has added critical considerations of the work of other investigators in this field, presenting the subject in such form as to offer the general practitioner a wide view of the subject, with indications for practical application of methods of treatment.

He is not obsessed with the idea that focal infection will explain the problem of chronic arthritis. The etiology is considered under such heads as The Role of Infection, The Influence of Bacteria, The Influence of Heredity and Constitution and Clinical Data bearing on the Etiology. Pathology is fully discussed, as is symptomatology and treatment. Specific types of arthritis receive separate consideration. The discussion of therapy is exhaustive without being prolix. It includes the treatment of focal infections, intestinal sources, vaccines, physiotherapy including heat, massage, exercise, diathermy, ultra-violet light, dietetic measures and medicinal therapy.

The writer is not a pessimist as regards results of active measures. He believes in vigorous treatment with sustained and intensive effort; that arthritis is not to be considered an incurable disease, that in fact there are few disease states for which more can be done.

The volume is a splendid presentation of the subject which every practitioner will find most useful and helpful.

J. H. ELLIOTT

Recent Advances in Bacteriology and the Study of Infections. J. Henry Dible, M.B., M.R.C.P. 363 pages, 22 illustrations. Price 12/6. J. & A. Churchill, London, 1929.

Nowadays there is no branch of medicine with which it is easy to keep abreast. In accordance with the famous classification of whiskeys one may say that there is no such thing as an easily comprehended specialty; only, some are much more difficult to keep up with than others. Bacteriology will readily be admitted to belong to this latter group, and a book which deals with it in accordance with the "Recent Advances" methods is distinctly welcome.

The author shows how really difficult it is to compress such an immense and complex subject and yet make it intelligible. He has tried, however, to take a broad view of many subjects, and to present

a readable account of recent work which may be easily grasped by the general reader. Such a task requires not only sound knowledge but clear presentation, and Dr. Dible shows himself to be well qualified in both respects.

It is difficult to pick out any one chapter for special mention; perhaps that dealing with "The Streptococcus Problem" is amongst the best in its arrangement. In many cases an adequate historical comment is made. Some of the chapter headings are as follows, "The Bacteriophage"—an excellent summary of what promised so much and has not brought forth the fruit that was hoped for; "Calmette and B.C.G.," in which the conservative view is well upheld by statistical and experimental evidence; "Ultra-microscopic and Filter-passing Viruses," to which three chapters are devoted, a proof of the place occupied by this subject in modern bacteriology; "Recent Work on the Pneumococci," on "Spirochetal Infections," etc.

These are but a few of the points dealt with. They are mentioned to show something of the variety of material in a book which is a most useful addition to the growing series of summaries on medical subjects.

H. E. MACDERMOT

Indigestion; Its Differential Diagnosis and Treatment.

Herbert J. Paterson, M.D. 153 pages. Price 7/6 net. William Heinemann Ltd., London, 1929.

The author states that this book is for clinical use and that references to statistics, etiology and pathology have been omitted.

He insists on the great importance of a careful history and emphasizes how much can be learned from a gastric analysis, which can be so easily carried out. He goes into this latter point in some detail.

At the beginning of the chapter on indigestion of intestinal origin the author says: "It is probably not an exaggeration to state that a large proportion of cases of indigestion are secondary to causes outside the stomach." This seems to anybody who has had to do with hospital and particularly out-patient practice to be a most moderate estimate of the facts.

In speaking of colopecty he says: "Like the other pexies I have never seen any benefit accrue from it."

Forty-three pages are devoted to gastric and duodenal ulcer. He thinks vomiting is a more common symptom than is usually supposed, and says it occurred in 60 per cent of his duodenal cases. This would be some 20 per cent higher than other estimates of this symptom in cases without organic obstruction.

In the treatment of ulcers, both gastric and duodenal, he insists on rest in bed for six to nine weeks, does not allow fish for 6 weeks and no "butcher's meat" for six to nine months. His account of the Sippy diet is incorrect as to quantities, time of giving and the composition of the powders, and he thinks its exponents claim too much for it, exhibiting as he says "an innocent optimism."

For the surgical treatment of both gastric and duodenal ulcers he prefers gastro-enterostomy and says he has only 10 per cent of unsatisfactory results with gastric ulcer cases, which is not quite so good but safer than when gastrectomy is done. He forgets to mention that the ulcer remains and about half the number only would be distal to the gastro-enterostomy stoma, but he does say emphatically that even after successful operation permanent care of diet is essential.

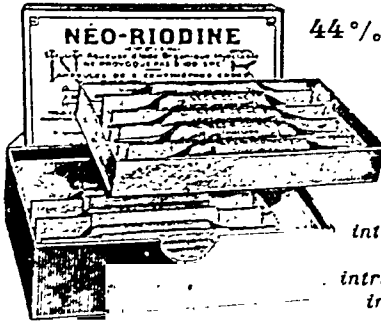
A very interesting point is that the author repeatedly insists that the appendix is the most frequent cause of trouble, both in setting up indigestion reflexly and as the focus causing ulcer. This point and the plea he makes for the more common use of gastric analysis are the most interesting features of the book.

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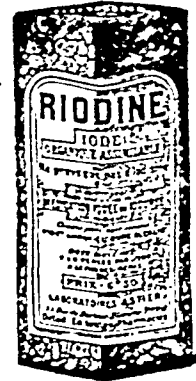
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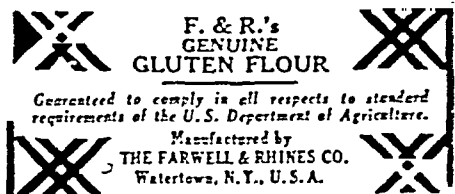
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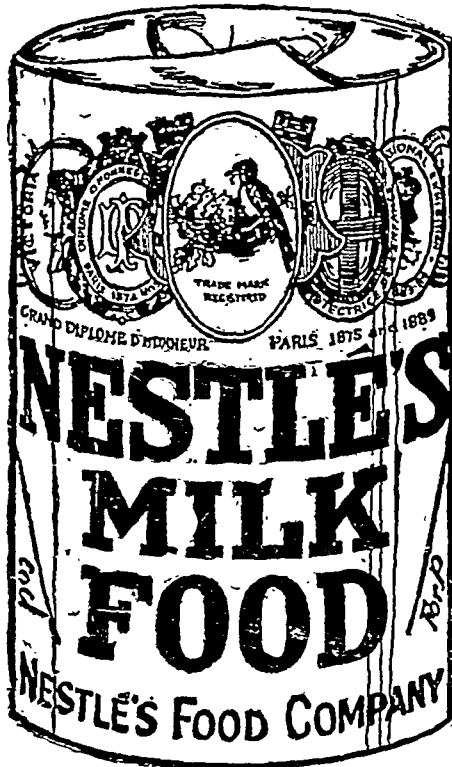
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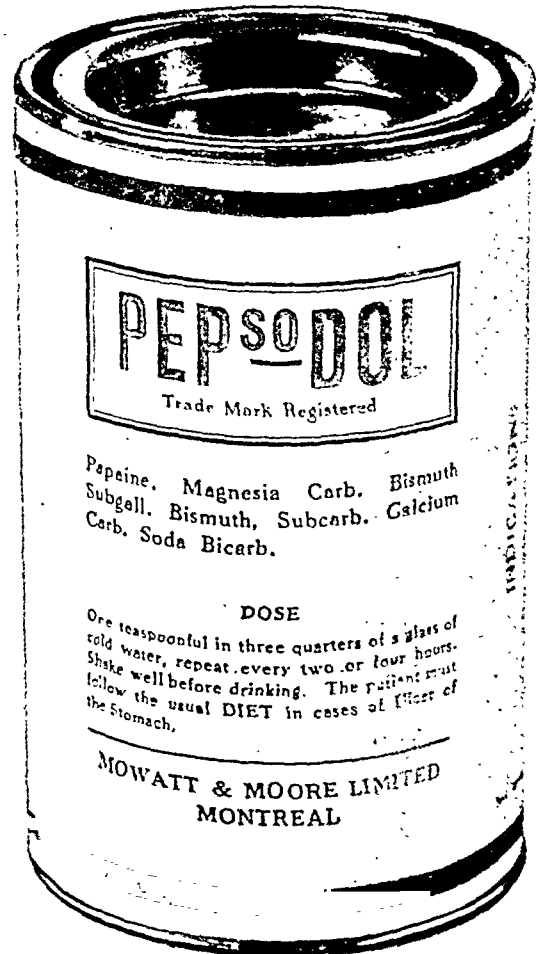
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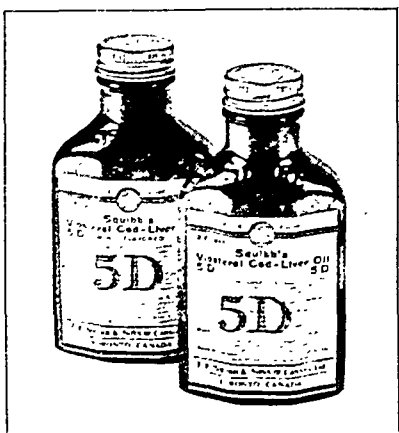
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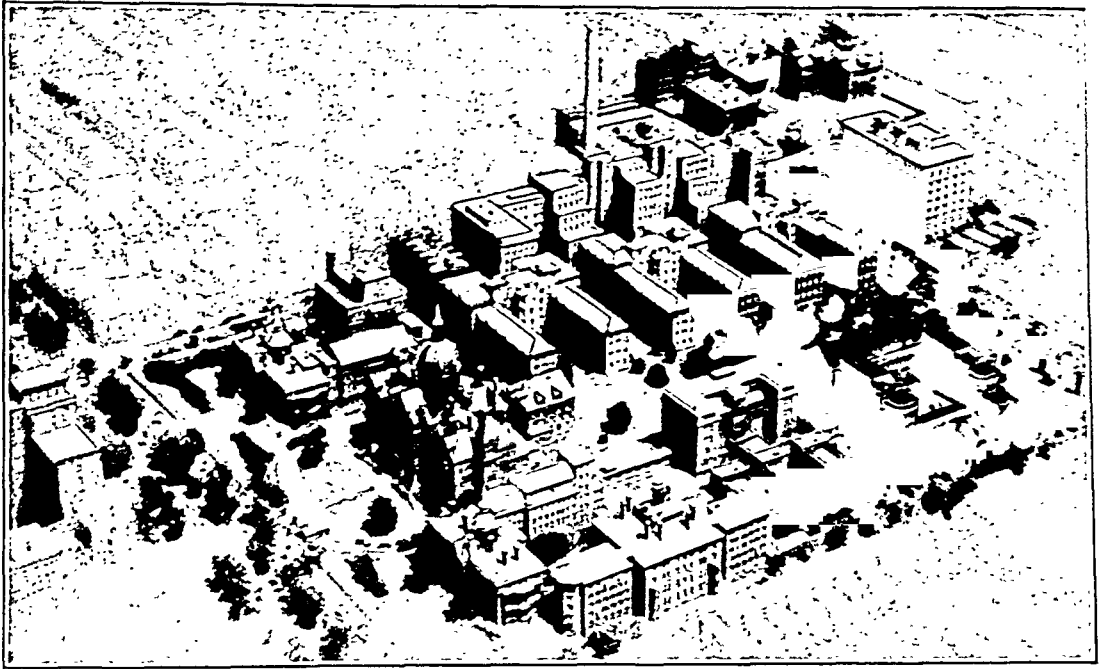
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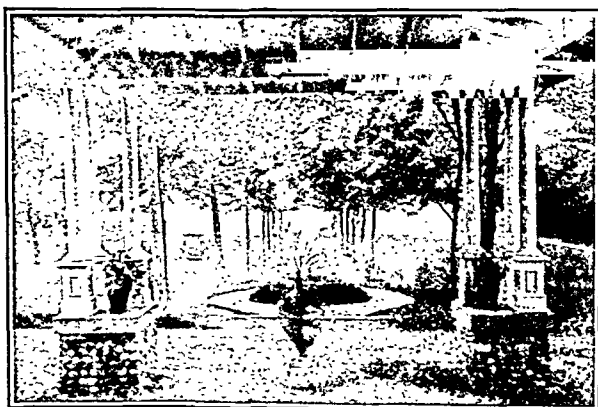
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Gynaecology	Oct. 4 to Oct. 26—Chelsea Hospital for Women. Mornings and/or afternoons. Fee £5 5s. 0d.
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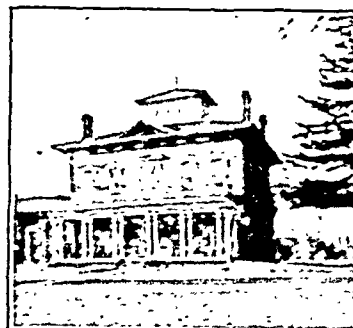
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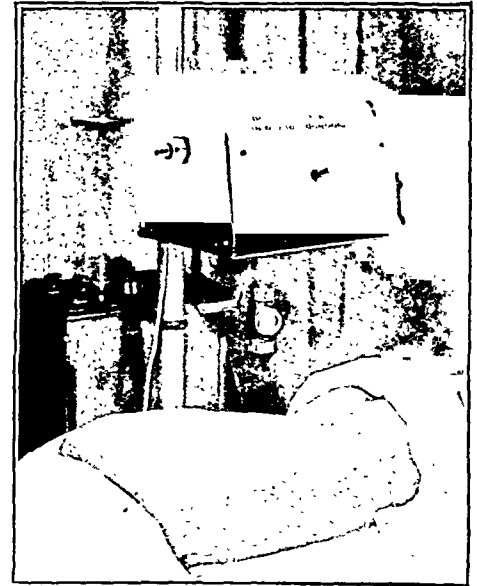
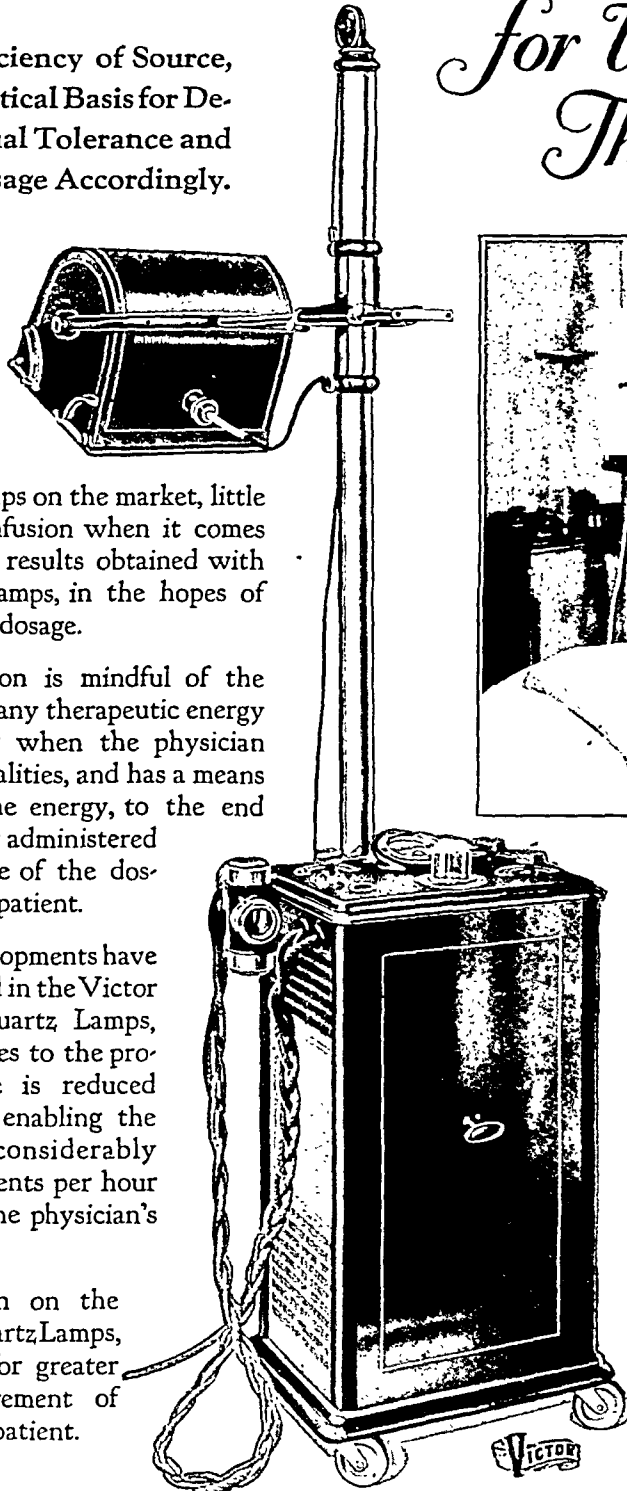
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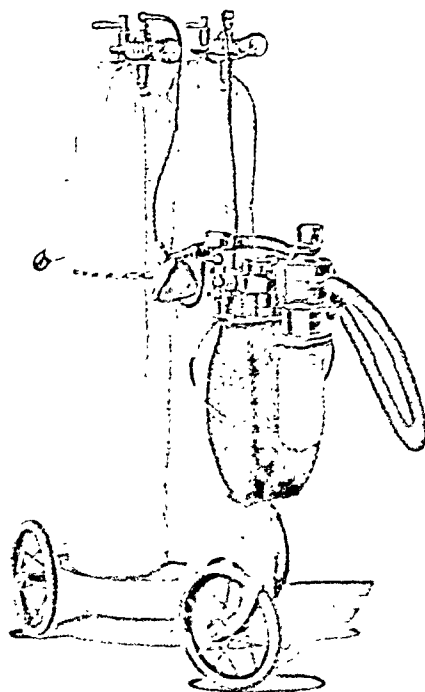
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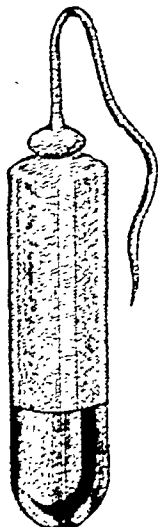
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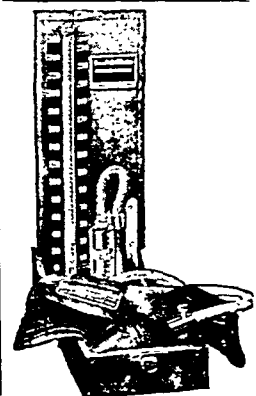
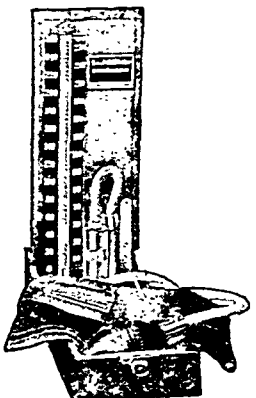
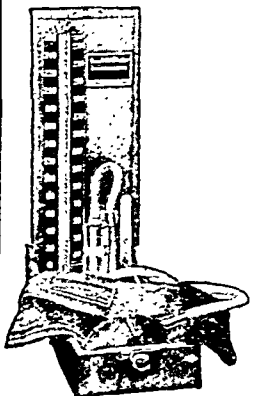
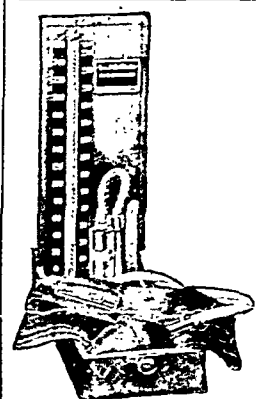
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SPECIALIZATION in this one field of endeavor—bloodpressure apparatus—has enabled us to attain in the *Lifetime Baumanometer*, the highest degree of *Accuracy—Simplicity—Permanence—Beauty*—the four chief essentials of modern bloodpressure instruments. Under these headings we list the many innovations and refinements that insure these in faithful performance to Baumanometer owners.



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Every *Lifetime Baumanometer* is individually calibrated, scientifically accurate and GUARANTEED to remain so—accurately interchangeable glass Cartridge Tube and standardized steel reservoir—stabilized mercury column—no oscillations—no mercury spilling—minimum oxidation—readily cleanable tube and reservoir—calibrations directly on tube, white background for mercury—most easily read scale and tube and *a full unobstructed scale reading from 0 to 260 or 300 mm.—no parallax errors. A master instrument!*

Utmost Simplicity

Instantly ready for use—no adjustments, attachments, or fitting several parts together—one compact, EASILY PORTABLE unit—positive control over mercury column—equally practical for desk or out side use. *The essence of simplicity!*

Real Permanence

Glass Cartridge Tube GUARANTEED AGAINST BREAKAGE FOR YOUR LIFETIME (a written guarantee is given to every purchaser)—entire manometer unit encased in metal and *chromium-plated*—no cemented joints—no friction points—nothing to get out of order—nothing to wear out except pure gum tubing and bag and English handmade pure gum Baumanometer bulb which will last for years. *A truly lifetime apparatus!*

Well-Proportioned Beauty

Hand-rubbed solid walnut case—beautiful ivoroid scale—the result of years of specialized endeavor to perfect an instrument of correct proportion, design, and construction. *A beautiful and modern piece of equipment!*

You Couldn't
Expect More—

**Lifetime
Baumanometer**
STANDARD FOR BLOODPRESSURE

Don't Be Satis-
fied With Less

W.A. Baum Co. Inc. - Originators
and Makers Since 1916 of Bloodpressure Apparatus Exclusively

100 FIFTH AVENUE

NEW YORK

The merger of the Acme-International X-Ray Company of Chicago and the Engeln Electric Company of Cleveland, to be known as the American X-Ray Corporation, has just been announced, effective July 1st, 1929. Both of these companies have for many years played a conspicuous rôle in the development of X-Ray and Physical Therapy apparatus, and have won a vast number of friends in the medical profession throughout the country.

The extensive lines of both companies will be retained essentially unchanged, and a wide distributing organization, covering the United States and many foreign countries, will be maintained to service the products and give the closest personal attention to the requirements of the medical profession.

This concentration, bringing together greatly increased facilities for production, research, experimental and educational activities, should prove of striking benefit to the profession, which is now offered an exceptionally wide line from which to choose suitable equipment, and is assured of excellent service facilities in any part of the country.

Leonard A. Busby, President of the Chicago City Railways, was elected President of the American X-Ray Corporation, a very good index of the financial strength and the sound business policies which characterize this new organization. The officials who have in the past guided the two companies to a position of leadership in the industry, remain actively in charge of its management; H. P. Engeln, First Vice-President in charge of Sales; Frank L. Severance, Vice-President and General Manager; and Montford Morrison, Vice-President and Chief Engineer.

How to insure the full therapeutic value of medicaments administered in tablet form has long been a problem of importance to the medical profession. Every physician knows that tablets made by the mass process often lose much of their effectiveness through excessive heat and saturation. As a result their physiological action is often seriously restricted, many mass-made tablets yielding only 25 to 75% medicinal value.

An important improvement in tablet manufacture is embodied in Pulvoids, originated in the laboratories of The Drug Products Co., Inc., of New York. These are pulverous under thumb pressure, an important mechanical advantage insuring the integrity of all ingredients and rapid disintegration and absorption in the stomach. They insure uniformity and reliability of dosage, as to both quantity and quality.

The following preparations are made in Pulvoid form: Pulvoids Aurazyme, for the nervous element in diabetes; Taurophen, intestinal toxemia and gall bladder stimulant; Cal-Salicylic Co., chronic intestinal toxemia; Thyovaco, amenorrhea, dysmenorrhea, menorrhagia and menopause; Digitex, P.T., standardized Digitalis leaves, fat free.

A new 16-page booklet, "Why Physicians Prefer Pulvoids," will be mailed free upon request to The Drug Products Co., Inc., Long Island City, New York.



Perhaps *the cause lies* *in the FOOT*

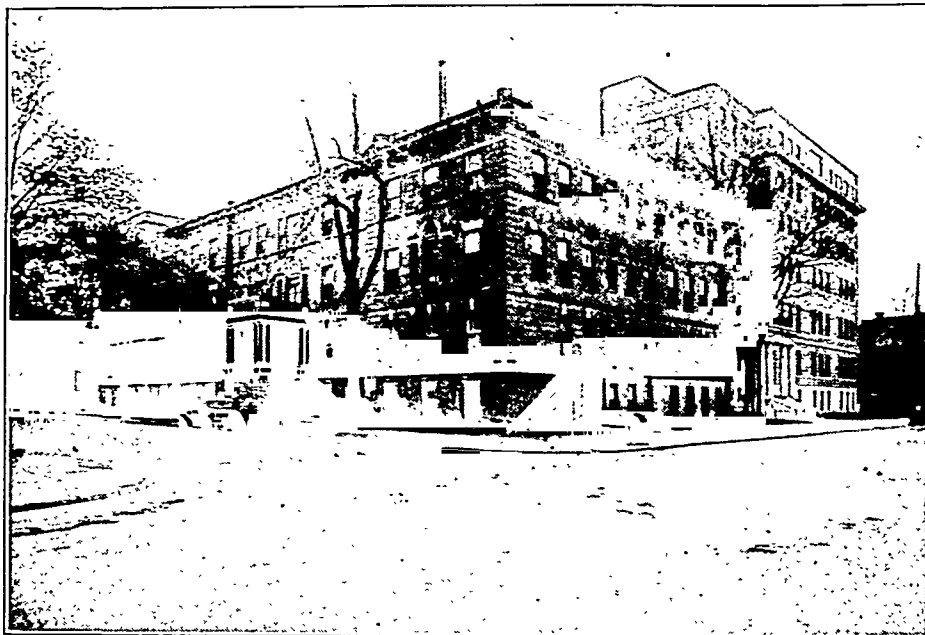
With medical research establishing, more and more, the foot as the causative factor in many serious organic troubles, the examination of the foot as an aid in arriving at a diagnosis assumes increasing proportions, as every physician is aware. However, when examination has disclosed the existence of an abnormal condition, as is so frequently the case, another question is apt to arise: "What shoe will best aid in relieving and correcting this condition?"

Obviously it must be a shoe that will comfortably support the weakened foot in proper position. At the same time it must have flexibility to allow the foot to exercise and thus regain normal strength and function. It must conform to the natural shape of the foot, providing ample room for the tread of the foot and the toes.

The Cantilever Shoe fulfills all these requirements. Its straight inner border, flexible shank, correct heel and natural shape are the features which have induced many leading physicians to prescribe or suggest the Cantilever Shoe to their patients. They report that many patients find instant relief in Cantilever Shoes and that they are of decided value in correcting the so prevalent weaknesses and distortions of the feet.

If you wish further information on the corrective features of the Cantilever Shoe, we shall be pleased to furnish you with an informative brochure, "The Feet and Their Relation to Anatomical Disorders." Please write to Cantilever Shoe Corporation, Department G1, 410 Willoughby Ave., Brooklyn, N.Y.

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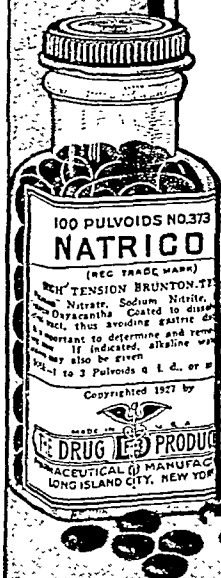


AUGUST
to FROST
HAY-FEVER



MAY-JUNE
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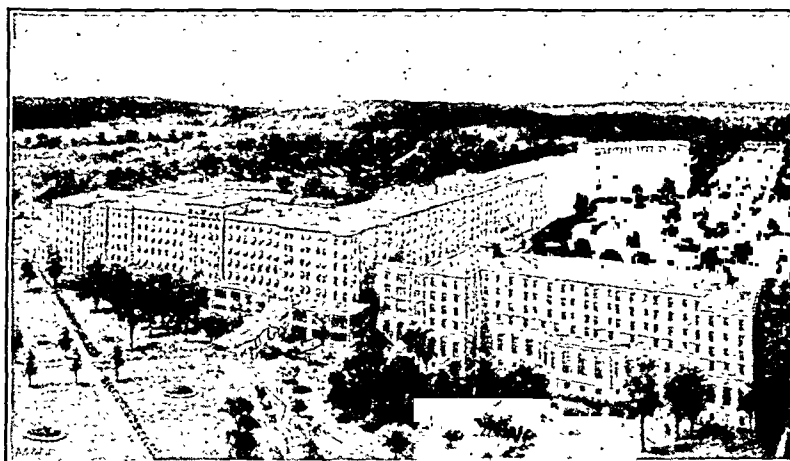


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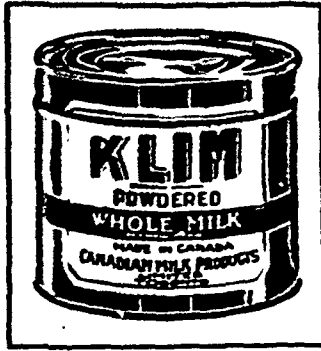
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